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PEAT FUEL:

HOW TO MAKE IT

AND

HOW TO USE IT.

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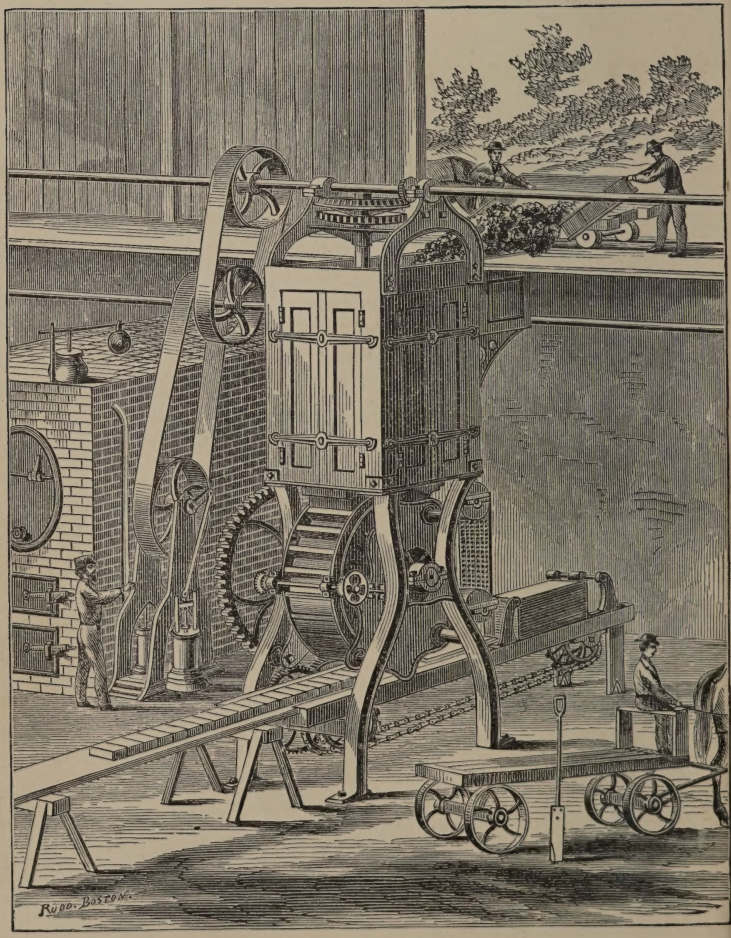
WHAT IT COSTS AND WHAT IT IS WORTH.

BY T. H. LEAVITT.

BOSTON:
LEE & SHEPARD, PUBLISHERS.



LEAVITT'S PEAT MILL.

Improved 1870.

PEAT FUEL:

HOW TO MAKE IT,

AND

HOW TO USE IT.

7869.3

CONTAINING

A DESCRIPTION OF AN IMPROVED PROCESS AND IMPROVED MACHINERY FOR MANUFACTURING THE FUEL.

ALSO, A VARIETY OF INFORMATION CONCERNING PEAT FUEL, ITS PROPERTIES, USES, AND VALUE; TOGETHER WITH OPINIONS CONCERNING IT, AS EXPRESSED BY CORRESPONDENTS IN VARIOUS PARTS OF THE COUNTRY, AND BY THE NEWSPAPER PRESS.

ALSO, DIRECTIONS WHERE TO OBTAIN FURTHER INFORMATION, RELIABLE AND MORE EXTENDED, UPON THIS SUBJECT.

SOME OR ALL OF WHICH, IT IS PRESUMED, WILL BE CONSIDERED WORTHY THE ATTENTION OF PARTIES INTERESTED IN THE SUBJECT OF CHEAP FUEL.

BY T. H. LEAVITT.

7119

BOSTON:
LEE AND SHEPARD.
1870.

From 5967.7
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Feb. 12, 1877

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Table of Contents of the Work entitled "Facts about Peat." —
Appendix to the same Work. . . . . —
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THE prime object of this publication is to call attention to an improved process and improved machinery for the manufacture of Peat Fuel, which are described and illustrated in the following pages.

But, as an intelligent opinion concerning the value, importance, or practicability of these can hardly be supposed to be had from a description alone, I have deemed it proper to add a few facts and statements bearing upon the subject of peat, and its manufacture and use, in such variety as to afford, at least, brief reply to many of the inquiries which would naturally be made concerning it; to which I have added extracts from letters received from all parts of the country, most of them of very recent date, together with brief reports of a few trials of the fuel, not before published; which are given as illustrative of the *present* interest in the enterprise, and accumulating testimony concerning the value of the fuel, and the practicability of producing and using it.

Those who would learn still more in relation to the subject, will find it thoroughly treated of in the book entitled

FACTS ABOUT PEAT, *third edition, revised and enlarged*, published by LEE & SHEPARD, 149 Washington Street, Boston: price $1.75, — which will be forwarded by mail, to any address, on receipt of the price, by the publishers, or by ORANGE JUDD & Co., 41 Park Row, New York.

And in order that the character of that work may be understood, I have, by permission of the publishers, printed from their stereotype plates, and appended hereto, the table of "Contents," with some "Opinions of the Press," &c., concerning it.

I have also added to this, a part of the "Appendix" of the work above referred to, consisting mainly of extracts from newspapers from all parts of the country, the perusal of which will be found of interest, while at the same time they indicate a unanimity of desire and harmony of views upon this subject of "peat fuel," "cheap fuel," and "good fuel," that is rarely observed, or voluntarily expressed, concerning any new enterprise, to such an extent as is here apparent.

T. H. L.

N. B. I shall esteem it a favor to be informed at any time, by any person, of any facts, however trifling, bearing upon this subject, and shall endeavor to make proper use of them in aid of the common cause of *cheap fuel*.

LEAVITT'S

IMPROVED

Condensing and Moulding Mill

FOR THE MANUFACTURE OF

PEAT FUEL.

THESE *machines are simple, compact, strong, and effectual for the purpose required.*

As at present constructed, they possess important improvements over anything heretofore operated, either in this country or in Europe; overcoming difficulties hitherto considered insurmountable, and attaining results which, until recently, have been pronounced impracticable; and, as the result of persistent investigation, and long-continued and thorough practical operation, are believed to embody, in the most *simple manner* possible, all the essential requisites for producing from peat *the best fuel*, in *large quantities*, in *good merchantable shape*, and at the *least cost.*

An essential feature of these machines, and this process of manufacture, is, that a portion of the water contained in the crude peat is extracted by mechanical means in the process of manufacture, leaving the blocks, as they come from the mill, dense, strong, and in condition to be haked or piled up under cover and left to cure.

This is a result which has never before been attained.

It should be understood, however, that under almost any circumstances it is better to expose it in the open air, for a short time at least, before housing it.

Another marked peculiarity of this process, as shown in its results, is, that the original organization of the peat is entirely destroyed, and instead of a soft, porous, sponge-like mass, we find, as a product, a material having more the appearance of a mineral substance, which breaks with a fracture similar to stone, and which, even when finely pulverized, can never again be dissolved in water, but retains permanently its mineral-like qualities.

The cost for labor and power to manufacture the fuel is less than two dollars per ton.

The machines are of two sizes: one is of the capacity of eighty tons of crude peat per day of ten hours, producing *forty thousand blocks*, measuring $10 \times 4 \times 2\frac{1}{2}$ *inches*, weighing about four pounds each, and yielding, when dry, a product of from twenty to twenty-five tons of good merchantable fuel.

Requires about six-horse power to operate it to its full capacity.

Weighs about two and a half tons.

Price, twenty-two hundred dollars.

The other is of double the capacity of the one above described, say *one hundred and sixty tons* of crude peat per day, producing *eighty thousand* blocks of same size, and yielding a product of from forty to fifty tons of good merchantable fuel.

Requires about ten-horse power to operate it.

Weighs about three and a half tons.

Price, three thousand dollars.

Machines of similar construction, but without the apparatus for extracting water, can be furnished for $1,000, and $1,500.

These prices cover also the right to use, free from any royalty or extra charge, under my Letters Patent.

The "capacity" stated above indicates their fair working service, but they can be gauged to run at half or quarter speed, — and are also capable of being run to nearly double the quantity stated.

The machines are boxed and shipped in such manner as to be easily and safely transported to any part of the country.

Carefully prepared instructions, in detail, for setting up and running, are sent with each machine; so clear and distinct, that with no more than ordinary tact and ability they may be set up and operated without difficulty or hinderance.

The machines are complete, with driving pulleys attached, and ready to receive the belt as soon as set up.

They are more perfectly constructed machines than have ever before been produced for the purpose, or than most people are prepared to look for, are strong, thoroughly built, accurately adjusted, and not only meet the approval, but receive the unqualified commendation of numerous experienced machinists and engineers, and are, withal, attractive in style and operation.

They are very simple in construction and operation, and are easily managed.

☞ *The machines are built to order only;* and for this reason, it is desirable that parties wishing to purchase should give their orders in ample season, so as to avoid the possible delay which might otherwise occur, though they can generally be furnished at short notice.

☞ *A machine can be seen* in operation any day, in a building near my office, in Boston, and parties interested are invited to inspect it thoroughly.

T. H. LEAVITT,

No. 41 Kilby Street, Boston.

Also a smaller mill, portable, can be run by steam or horse power, capable of turning out the material for six to ten tons of dry fuel per day. Price $600. Weight about 2500 lbs.

Desirable for farmer's use or where several can club together to make fuel for their own families or for sale.

PEAT AS AN ARTICLE OF FUEL.

REMARKS.

NOTWITHSTANDING a somewhat prevalent idea to the contrary, it is nevertheless a *fact*, that the peat fuel enterprise is quietly, but steadily and surely working its way to a very strong hold upon public favor; and that, too, solely *upon its intrinsic merits.*

This statement is made from a wide range of personal intercourse and correspondence, and the indications are plain and undeniable.

That this will have an important bearing upon the price of fuel generally, and especially upon the monopolies in the coal trade, none can question; while as a legitimate business, claiming attention through a region of country far exceeding in extent our coal fields, it gives promise of success to a degree rarely apparent at so early a stage in any enterprise; and for the one prominent reason, above all others, that *the people* have a common interest in it.

FIRE AND FUEL.

"The importance which in every age, from the earliest period of human existence, must have been attached to fire, and the necessity which has ever impelled mankind to provide for it, not so much for purposes of luxury, as an absolute essential to enable them to counteract the effects of climate, and other external influences which affect the human frame,

are sufficient, apart from any other considerations, to impress every one with a sense of its usefulness."

Some kind of fuel has always been an article of prime necessity to man; at least from the time when he began to prepare his food by the heat of fire, or had learned to prize its comfortable warmth in the cold of winter. As experience was gained in the properties and uses of materials about him, the applications of fuel to supply his increased wants were multiplied.

But the comparatively modern discovery of its being the most available source of motive-power has given to it a new importance hardly inferior to that derived from its other uses; causing it to contribute, more than all other resources of nations, to their wealth and prosperity.

The means of obtaining this, then, are of chief importance in every manufacture; and the questions of its supply, preparation, and most economical application, are of the highest interest.

The substances usually employed as fuel are *wood*, *coal*, and *peat*, either in their natural state, or modified by peculiar treatment.

The abundance of all or either of these in a country, must always constitute a principal source of its wealth, more especially since steam has become the moving power of manufacturing industry, as well as the great agent in locomotion.

It is evident, therefore, that none of the productions of nature should be more carefully husbanded than those which can be used for fuel.

Every attempt also to improve the quality of inferior materials, so as to increase their efficiency as heat-producers, and consequently their value, should be liberally encouraged.

For objects requiring a quick heat, and at the same time diffused over a considerable space, the most inflammable fuels are found most efficient.

The results of numerous experiments, practical as well as

scientific, go to show that *peat*, in its rudely-prepared state, goes far toward answering these requirements; and, when solidified, it is for most purposes superior.

Wood, peat, and coal, though so different in physical appearance, are nevertheless very closely allied in composition: all the three being chiefly composed of ligneous fibre, a compound of four simple elements, — carbon, hydrogen, oxygen, and nitrogen.

Physical effects have induced certain changes in some kinds of peat and coal, which cause them to differ considerably in their properties from woody fibre; but, data are found, quite sufficient to warrant the inference that both are of vegetable origin.

PEAT AS AN ARTICLE OF FUEL.

Of wood and coal in all their variety, the manner of preparation, and use as fuel for domestic and manufacturing purposes, the community may be said to need no information; their use is so common and universal that all have constant practical experience of their nature and value.

Not so with PEAT: it is by no means so generally used. Its value may be said to be entirely unknown to many; and even those who have used it in its crude state do not appear to realize the increased value it would possess, and the extent to which it might be used, especially for manufacturing purposes, if *properly prepared*, and placed in the market.

We have, then, to treat of it, to some extent, as a new article; and, without in anywise attempting or pretending to offer all that might be said of it, it will be our aim to give briefly, in these pages, just enough of facts and suggestions to stimulate to further inquiry and to interest the community in the development and use of those rich resources of fuel which lie about us, in quantities sufficient for the demands for ages, and which require only ordinary enterprise and skill, with moderate means to develop.

Peat, when properly cured, burns freely, gives a steady and intense heat, and the uniform testimony of those who use it bears witness to its superiority in many respects.

For the great purposes of commerce and manufactures, something more is necessary than merely to take the peat from its native bed. As it comes from the earth, it is porous, more or less filled with roots, fibres, and undecomposed matter. In this state it is spongy and bulky, consumes easily, and with comparative rapidity. When purified, and made dense, it furnishes a fuel which, for intensity of heat and durability, as well as cheapness, is superior to the best charcoal, and for many purposes better than anthracite.

EFFORTS TO PREPARE IT FOR USE.

Much has been done, both in this country and Europe, to demonstrate its properties and value; and it seems to have been a common aim of all who have undertaken its manufacture or use, to condense and solidify it, and put it in merchantable shape.

The number and variety of machines and devices which have been invented, patented, or attempted to be used for these purposes, are astonishing; and, although all have agreed that such results were practicable, few have actually arrived at anything like a satisfactory method of preparing it; and none, until recently, so far as we are aware, have arrived at that complete success which is essential to the profitable and universal introduction of an article of this character.

It is now apparent that most of the attempts referred to have failed of success from the fact that the *nature* of the article was not comprehended; and the principle generally started upon — to wit, that it could be condensed and produced in good merchantable shape by means of powerful *pressure*, applied in one form or another — was *wrong*.

This will hardly be credited; but facts prove it to be the case.

Peat is a curious substance, possessing peculiarities of a very interesting character.

The fact that it is exceedingly elastic, presenting in this respect some of the characteristics of India-rubber or gutta-percha, and also that it is remarkably tenacious of water, will account to some extent for the impossibility of producing, by pressure alone, a solid, dry substance.

A process has, however, recently been discovered and applied, by which peat may be converted into a solid, dry fuel, in good shape, in large quantities, and at moderate cost. It is demonstrated, beyond a question, to be a perfect success.

The machinery is exceedingly simple in its construction and operation, and is by no means expensive, compared with the amount and value of the fuel produced by it.

Like most inventions of the present day it has been patented; but it is the aim of the parties having the control of the matter to encourage and stimulate the manufacture of the fuel, and to this end they are granting the right to work under their patents, and furnishing the necessary machinery and instructions at rates which are within the reach of any enterprising man.

THE USES OF PEAT FUEL.

Of the purposes to which peat as a fuel can be applied, and the manner in which it can be used, the range is as wide as for wood or coal, or both.

For domestic purposes, — as the heating of dwellings, whether by furnace, or any of the innumerable varieties of stoves, or the open grate, — it is equal, if not superior, to wood or coal of any kind, save only the fact that it requires in most cases, to be replenished more frequently than coal; but it gives a more steady, intense, yet mellow and agreeable heat than any other fuel. In open grates, as a substitute for cannel coal, it is admirable, and produces the most cheerful fire imaginable.

In manufacturing and mechanical establishments it is available wherever fuel is required, and for many purposes possesses characteristics which render it decidedly superior; as, for instance, the production of iron and steel, and the working and manufacture of them, where the simple fact of the entire absence of sulphur, or any substance prejudicial to the quality of the metal, is a consideration of immense value.

For generating steam, it is, when solidified, second to no other fuel, and superior to most. It ignites freely; burns with considerable flame; gives an intense heat; and leaves no residuum except a fine light ash, which passes off freely, and leaves the grate-bars always free and clear, — a consideration which will be readily appreciated by any fireman or engineer who has had a single day's experience with the dross and clinker, which is inevitable where coal is used.

A mass of facts have from time to time been published, which go to prove the truth of these statements; and the few which we shall be able to give in these pages, and the authorities to which we shall make reference, will, we think, satisfy even the most sceptical that the subject is at least worthy of investigation and experiment.

If, then, we have at our own doors an article of fuel equal or superior to that which we now bring from a great distance, and upon which we are, and for many years have been, mainly dependent, is it not apparent that an immense field for enterprise is open to us, even though the actual gain were confined to the single item of cost of transportation saved? But it is probably true, that, in ordinary times, peat can be excavated, prepared, and cured ready for use, at less cost than coal can be mined and prepared for shipment.

Through a very large portion of the territory of the Northern States, the deposits of peat are so freely distributed, that it would probably average as near a market or place of consumption as does the ordinary supply of wood now used for domestic purposes.

For the supply of iron works, machine shops, and manufacturing establishments, whether for the purpose of working the metals, or generating steam for power, it will, in most cases, be found that deposits of peat lie within a short distance of the place of consumption; and for some of our largest establishments, requiring immense amounts of fuel, it is known that supplies of an extent equal to their requirements for many years lie almost at their doors.

So, too, for our railroads, peat is *the* fuel. It is easily handled; ignites almost instantly; burns freely, leaving no residuum excepting light ashes, so that the grate-bars are always clean; and generates steam in a manner to charm the most exacting engineer.

There are along the line of every railroad in New England, deposits of excellent peat, equal to their requirements for years to come; and it would seem more than probable, in view of all these facts, that, within a very short time, many of our manufacturing establishments and all our railroads will have each their own peat-meadow and fuel-factory: the practical results of which will be, as relates to manufacturing establishments, either a reduction in cost to the consumer of the articles and fabrics produced, or increased dividends to stockholders, or both; as relates to metals, and the various articles into which they are manufactured, superior quality, temper, etc., and a consequent increase of value, without increase of cost; and as relates to steam power for transportation by land or water, a diminution of cost, which may inure, by the reduction of rates, to the benefit of the travelling and commercial interests, or, without reduction of rates, to the gain of stockholders; or, by such management as may be most reasonably anticipated, the results would in all probability prove favorable to the interests of all concerned.

THE PROCESS OF MANUFACTURE.

The machine before referred to, occupies a space of about five by ten feet on the floor, and is ten feet high. It receives the crude peat just as it is taken from the bogs, relieves it, at once, of a portion of the water contained in it, cuts up any sticks, roots or fibrous material which may be mingled with it, crushes the entire mass and ejects from it the air, of which a large amount is contained in its cells, and taking advantage of some of the natural properties of the material, develops, by simple but uniform and severe treatment, its plastic and adhesive properties, while at the same time the particles are drawn out, laminated, and packed in such manner that it forms a dense mass in the nature of felt, having strength and cohesion, indeed it may at this stage be called a *wet felt*.

In this condition it is formed into blocks, in strong moulds, having porous sides, and each block is submitted to powerful pressure, not for the purpose of compacting it or increasing its density, for in this condition it will dry nearly as hard as coal; but for the purpose of extracting, at this stage, an additional portion of the moisture, which, until this time it had been necessary to retain in the mass, for its proper treatment.

The blocks are then delivered in rapid and uniform succession upon boards 30×10 inches in size, each of which receives six blocks, and are easily handled, or the blocks may be delivered upon an endless belt, carried by this means to any distance from the machine, and removed at pleasure.

They may be housed at once and left to cure and dry like wood, or they may be exposed in the open air like brick, for a short time, which expedites the process of drying, if haste is required.

By another very simple arrangement, in the nature of a heater, within the body of the mill, but occupying very little space, the pulp or felt is brought to a high temperature just before it is packed in the moulds, and the blocks, as deliv-

ered, are *hot*, so that the process of evaporation commences at once, not from a heated *surface* alone, but from the heated *mass* entire, and must continue to a degree which could not otherwise be produced, — until the heat *in* the block is exhausted, accomplishing by this means, in a single hour, what could hardly be realized in a day or days under ordinary methods of treatment.

RESULTS.

The process is exceedingly simple, rapid, and successful, and shows results which have never before been realized.

CONDENSED PEAT.

The fuel prepared by this process is called *condensed* peat, in contradistinction from *compressed* peat; the material being absolutely *condensed* without pressure; the pressure which is applied, as above stated, being simply for the purpose of extracting moisture, but not for compacting the mass.

MIXED FUELS.

By a slight modification of the machinery, it is practicable to produce a variety of mixed fuels (peat being the basis), such as are sometimes required for specific purposes.

The mixture of coal dust is accomplished most perfectly, — and highly inflammable fuels are produced by the mixture of certain oils, tar, asphaltum, and resinous substances, in given proportions, as required.

Crushed ores, for smelting, are also compounded with peat, by this arrangement, to great advantage.

TREATMENT.

The *principles* involved in the treatment of peat by the process before referred to, are demonstrated to be correct.

The machinery is carefully adapted for the carrying out of the process, in all its details.

Of the various stages of treatment now combined in this process, I have had some in operation for several years, gaining by each year's experience something in the mode of application, while others are of comparatively recent introduction.

The original organization of the peat is entirely destroyed, and instead of a soft, porous, sponge-like mass, we have as a product, a material more of the consistency and appearance of coal, which breaks with a fracture similar to stone, and which can never again be dissolved in water, but retains permanently its mineral like qualities.

BUILDINGS REQUIRED.

THE BUILDINGS for sheltering the machinery and housing the fuel should be located on dry ground, near to and by the side of the bog, and may be of the most inexpensive character.

FOR ONE SET OF MACHINERY, with engine and boiler, a building twenty by twenty feet is large enough; and, for each additional set of machinery, ten feet in length should be added.

The most desirable location for this building is on a side-hill; so that, while the machinery is placed on the lower floor, the crude material may be easily hauled to the level of the second floor, and there dumped by the cart-load into the top of the mill.

The height between floors in this building should be ten feet.

The other buildings required are simply for shelter of the fuel; and their extent must, of course, be regulated by the amount manufactured.

CHARACTER AND QUALITY OF PEATS.

Peat varies in its character very materially in different localities; but as a general thing, we estimate that it is

reduced in the process of manufacture about two-thirds to three-quarters, both in weight and bulk, according to the character or composition of the crude material, and the drainage of the meadow or bog from which it is cut.

Peat from a well-drained meadow, retaining, of course, less water in the mass, is much more conveniently and economically manufactured than that from a meadow which is constantly overflowed; and the shrinkage, it will readily be understood, is less.

The *character* of peat depends mainly upon the vegetable growth from which it is formed, and the *purity* of the material depends much upon its locality and surroundings, that is whether sand or earth have been allowed to wash or blow in and mix with it.

Peats differ in density as well as woods, there being as wide difference in deposits of peat, as between pine wood and lignumvitæ.

From the best peats we can, of course, produce a superior article of hard, dry fuel; but an essential feature of our process is, that we are able to produce, with equal ease, a fair fuel from inferior and comparatively worthless crude material.

LABORERS REQUIRED.

Aside from the engineer, five men are required to operate this machine, — that is, two men to feed the peat into the mill, one man (or a *boy*) to place the boards (thirty inches by ten inches) in position to receive the blocks of peat as they come from the mill, and two men to remove the blocks from the mill.

The largest size machine requires the attention of about ten men, their principal employment being to feed the crude peat into the mill and remove from it the blocks as they are produced.

The laborers employed, with the exception of the engineer, may be of the least expensive class.

Either size of machines can be adjusted at pleasure, to run at either increased or diminished rate of speed, and with greater or less yield of manufactured material than is indicated in the foregoing statement.

Additional labor is, of course, required, to cut the peat and haul it to the mill, and also to remove the material when manufactured, and spread, house, or store it.

The cost of this, as is readily seen, must depend much upon the location and surroundings, but can be easily estimated by each individual in their own case.

COST OF MANUFACTURE.

The most liberal estimates, rating wages even as high as two dollars per day for men and one dollar for boys (which is higher than we have ever paid), corroborated by repeated statements of those who have manufactured the fuel, fail to make the entire cost for all the labor of cutting, hauling, manufacturing, housing, and storage, amount to more than *one dollar and fifty cents* per ton; while the statement repeatedly made, that the cost for labor need not exceed two dollars per ton, is believed to cover more than a fair allowance above the actual cost, for any contingencies, accidents, or delays, likely to occur in any properly managed establishment.

COST OF PEAT WORKS.

The cost of a machine, with engine, boiler, shafting, and the building in which to place and operate it, should be about five thousand dollars.

PRODUCT OF ONE MACHINE.

One machine turns out the material for about twenty to twenty-five tons of fuel per day, each ton of which is equal in value to a cord of the best oak wood, sawed, split, and ready for use, which is rarely so low as eight dollars per cord,

and often, in our cities, at least, reaches fifteen dollars per cord of *six cord feet* instead of *eight*.

Estimating, then, the *value* of the peat at *five dollars* per ton at the works, which, it will be allowed, places it fairly under the head of "*cheap fuel*," the product of a day's manufacture would be *one hundred to one hundred and twenty-five dollars*, — from this deduct for *cost*, as before stated, *two dollars* per ton, say *forty to fifty dollars*, and we have a gain of *sixty to seventy-five dollars* per day, and the credit of selling *good* fuel, *cheap*, at that.

If, then, out of the season, which is from April to October, seven months, we run only one hundred days, the gain will amount to from *six thousand to seventy-five hundred dollars* — or if one hundred and fifty days, which is a fairer estimate, the gain, at the same rate, would amount to from *nine thousand to eleven thousand two hundred and fifty dollars*.

In either case it shows a business of no inconsiderable gain, especially when we take into consideration the small amount of capital required to start and conduct it, compared with the results.

PEAT WORKS ON A LARGE SCALE.

The cost, as above stated, is for the product of one set of machinery; but, where several machines are to be operated in one establishment, and the business to be conducted on an extensive scale, the cost *pro rata* will be very much reduced, as the expense for building and engine and boiler will be but slightly increased, one man can easily superintend several machines, the laborers generally can be employed to better advantage, and numerous mechanical appliances, to save manual labor and expedite the operations, which it would not be advisable to construct where a single machine only was to be run, may be economically introduced on more extensive works. The profit of such an establishment will therefore be largely in excess of smaller works.

PRACTICAL OBSERVATIONS CONCERNING PEAT BEDS AND THE WORKING OF PEAT.

Some data concerning peat beds and the product of manufacture may be of interest. We threfore give the following as some of the results of our own observation, from repeated practical tests at the works at East Lexington, Mass., about ten miles from Boston.

A cubic foot of crude peat, as taken from a well-drained bog, weighs from fifty to fifty-five pounds.

This same quantity is *condensed* by the machinery in use at the works above mentioned, from thirty to forty per cent., according to the character or structure of the material, and that, too, before it is relieved from any of the water contained in the mass. In addition to this, the weight and bulk are both still further reduced, by the recent improvements for extracting water.

In this state it is formed into blocks of convenient size and shape, which may then be removed to sheds, or exposed for more rapid curing, in the open air.

Evaporation of the remaining moisture is greatly accelerated by the treatment the material has received while passing through the condensing mill, and on exposure in the open air is found to dry very quickly; but, of course, when sheltered or removed from the direct action of sun and wind, it dries or cures more slowly.

Its *bulk* is diminished by the forcible ejection of the air and a portion of the water contained in its cells, in the process of manufacture, and still further by the evaporation of the remaining moisture, while its weight is diminished solely by the loss of water.

A ton of wet peat, as cut, will measure about forty cubic feet; and about one hundred and sixty cubic feet of crude material are required to produce one ton of dry fuel. Some very compact peats, however, require not more than one hundred and forty, or even one hundred and twenty cubic feet for a ton of dry fuel.

One block, as it comes moist from the moulds, measures $10 \times 4 \times 2\frac{1}{2}$ inches ($= 100$ cubic inches), and weighs about four pounds.

The machines turn out respectively forty thousand and eighty thousand of these blocks per day.

The *best* place to dry the blocks is on the grass, in the open air, where they dry most rapidly and uniformly.

Of these blocks, as they come from the mill, about five hundred weigh over a ton, and when thoroughly dry, a ton in weight will be found to measure about thirty-five to thirty-eight bushels,

Peat, like wood, is undoubtedly much improved in quality, when housed and allowed to cure for a season, say three to six months, but it can be used very shortly after it is manufactured, especially if exposed for a short time, say one to six days (according to temperature, &c.) in the open air.

An acre of peat, of fair quality, well drained, if one foot in depth, will generally contain one thousand to twelve hundred tons, yielding two hundred and fifty to three hundred and fifty tons of dry fuel. Greater depths in proportion.

Few peats, however well drained, contain less than fifty per cent. of water, and most contain sixty-five to eighty-five per cent.

Our own estimates have always been made on seventy-five per cent. of moisture, which is safe; but it is quite probable that seventy per cent. would be fair in the majority of well-drained meadows.

When best drained, peat is worked to the best advantage, both as regards economy of labor and the quantity and quality of fuel produced.

Peats vary much in their heating properties, as do woods and coals, according to their growth and composition. The most thoroughly decomposed and compact deposits yield, when manufactured, the most dense fuel, at no greater cost for labor than the lighter and more porous material, and are therefore the cheapest.

Pure moss peats are invariably good. The most resinous

peats are shown to be the most valuable, especially for generating steam and for the production of gas.

Although peat fuel, properly manufactured, will stand considerable exposure to the weather, it will inevitably be injured to some extent by the rain and snow, sun and frost, if left uncovered long after it is fit for use; and every manufacturer and consumer will find it to be the wiser course, if he has a good article of fuel, to provide a suitable place for it, and take good care of it.

DRYING PEAT.

Frequent inquiry is made as to the practicability of drying peat by artificial means, and the best method of accomplishing it. That it *can* be dried by artificial means has been satisfactorily demonstrated; but we are by no means prepared to say, that the *best* and most *economical* method for accomplishing it has yet been devised.

A great variety of kilns are in operation, some of them certified and acknowledged to work almost to perfection in drying lumber, cotton, tobacco, etc.; but wet peat is obstinate, — will not yield kindly to the same treatment, — in fact is "a poser."

Its structure is entirely different from any of the materials mentioned above, and its peculiar properties must be considered in any process, which shall be successful in its treatment. Other points to be considered in perfecting a process for artificial drying, aside from the first cost of buildings and apparatus, are, the time required, the expense for fuel and labor, and the quality and characteristics of the fuel produced, as affected by the manner of drying.

We have no idea that artificial drying will be resorted to, to any extent, during good weather in the summer, at present; for Nature accomplishes the work for us, when she does it at all, better than art can, and at much less expense, for sunshine and wind cost nothing; but in stormy weather, and during the winter season, it would, in some cases, be desira-

ble to resort to it; though the process, now first successfully introduced, of extracting a large portion of the water by mechanical means, leaves so small an amount of moisture in the mass, that the necessity for artificial drying is in a great measure done away with, or, if resorted to at all, may probably be accomplished by much more simple and less expensive means and appliances than have heretofore been found necessary.

A light current of heated air, passing over and through the mass of peat, is what is required: the details of buildings, mechanical arrangement of the apparatus, and cost of fuel and labor, by which to attain the best results in the most rapid and economical manner, are points which cannot be said to have been sufficiently elucidated to admit of writing definitely in regard to them.

Steady progress is being made, and time, skill, and enterprise are sure to demonstrate the *best* method of artificial drying.

We have repeatedly, in good weather, by the improvements in our own process, manufactured a good fuel for locomotive service, *in four days from the bog*, and expect during the coming season, to do it in two days, with equal ease.

CORRESPONDENCE, &c.

The following extracts, mostly from very recent letters, including a few reports relating to the use of this fuel, not before published, are given as illustrative of the *present* interest in the enterprise, and as additional testimony concerning the value of peat for various purposes, and the want felt for it in many parts of the country.

Many of them are from parties occupying responsible positions in the business community, and whose opinions are entitled to respectful consideration.

From Pine Plains, Dutchess County, N. Y.

I have used a few cords for common fuel without manufacture; this, however, is not advantageous.

Had we good machines, at a price that we could afford to manufacture it, it would here supercede the use of coal.

From Nantucket, Mass.

There is a large extent of bog on this island, more or less fuel is prepared every summer, and it can be delivered on the wharf at about fifteen cents per bushel.

From Horicon, Wisconsin.

We are running a steam planing-mill, have an abundance of peat of good quality within a mile of our mill, and are thinking of using it for fuel; have tried it, and *know* that it is all right for steam fuel.

What is the cost of preparing it? Give us information about machinery, &c.

From South Carver, Mass.

We feel the need of cheap fuel. Coal is expensive, and we have to cart it five to ten miles; while, at the same time we have any quantity of good peat land, but at present almost worthless.

Wants information.

From Hebron, Indiana.

We have valuable deposits of peat, and yet no one here ever thinks of burning it for fuel, although wood, oak and ash, sells from four to five dollars per cord. We are on the Great Eastern Railroad, fifty-five miles from Chicago, and having lived in that city for nearly twenty years, and paid at all times twelve dollars to fourteen dollars per cord for wood, and fifteen dollars to twenty dollars per ton for coal, and twelve and a half to fifteen cents per bushel for coke, I cannot help feeling interested in the peat-fuel question, and shall *agitate* it.

From Rochester, N. Y.

At the Clinton Blast Furnace, in Ontario, Wayne County, N. Y., peat fuel was used with the following comparative results: —

"At the time of commencing, the furnace was running about twenty-five charges to the watch, with a limited amount of gas in the hot blast.

"The next watch, with one half peat, they made thirty-four charges, having an increased amount of gas in the hot blast and at the trundle head, demonstrating the fact that peat is equal, if not superior to the best of charcoal for the manufacture of pig iron."

From Glens Falls, N. Y.

The superintendent of the gas works, at Glens Falls, N. Y., states that he produced $5\frac{8}{10}$ cubic feet of gas to the pound of peat, while from the *best* coal used at the works, the yield of gas did not exceed $4\frac{4}{10}$ feet to the pound.

From Erie, Illinois.

"I have used peat the past winter. It is the best fuel I ever used, and the cheapest."

From Lansing, Michigan.

"I am satisfied, and have for some time past claimed, that we must depend on our peat deposits for fuel; and now, as our forests are so rapidly diminishing, and coal continues to increase in price, it seems to be a proper time for directing attention to this almost inexhaustible source of supply.

From the Watchman and Reflector, Boston.

We have visited the works at Lexington, and have seen the Leavitt mill in operation. We are highly pleased with it.

From all we can gather upon the subject, it seems to us that the time is not far distant when peat fuel is to take its place among the staple productions of our country. At any rate, all attempts to facilitate the production of cheap fuel should be liberally encouraged.

The subject is interesting, and cannot be easily exhausted.

From Harwich, Mass.

We have in this town several hundred acres of peat bottom,

many of which produce most excellent fuel. I have inquired of a *great many* house-wives, who have been in the habit of burning more or less peat every year, "Which do you like best for fuel, — peat, coal, or wood?" The reply has invariably been, without a single exception, "*peat, by all means.*"

From Edgarton, Rock County, Wisconsin.

We have large deposits of peat in this section, running from two to sixteen feet deep, and much of it lays along the lines of railroad. There is near this town nine hundred acres of peat marsh, and large quantities of it lying along Rock River.

"Janesville and Beloit are towns of ten thousand and nine thousand inhabitants, and they pay thirteen dollars for Illinois coal, and nineteen dollars to twenty-five dollars for Pennsylvania coal. Wood is worth from six dollars to fourteen dollars per cord, and scarce the year round, and two large factories, and railroad shops, and machine shops to be supplied.

"The railroads are paying five dollars to six dollars per cord for wood, and haul it twenty to one hundred miles.

"We have railroad and water communication to Milwaukie and many other larger towns, and manufactories would spring up if there was any motive power. *Peat fuel would furnish it*, and I have no doubt very large quantities could be sold in this section."

From Boston.

I have used, with much satisfaction, the peat fuel from Lexington, and think it superior to either wood or coal for domestic purposes.

Several of my acquaintances have also used it. They express surprise at its good qualities, and fully agree with me in my estimate of its value.

A Rochester, N. Y. paper states that an experiment was made on the New York Central Railroad, with peat taken

from a bed near Batavia; engine No. 95 was used. Twenty-eight hundred (2800) pounds of peat were put into the tender, and the ordinary passenger train was drawn from Batavia to Canandaigua and back to Batavia.

The distance run was one hundred and two miles, only a little more than half of the fuel was consumed.

The engineer thought he could have run to Canandaigua again, and half way back with what he had left in the tender.

The result shown is that 2800 pounds will run an engine about 175 miles, equal to 16 pounds of fuel to a mile run, or 125 miles to a ton (2000 lbs.) of peat fuel, — a result, which, with other advantages derived from the use of peat instead of coal, shows it to be a vast improvement upon all other kinds of fuel for steam engines.

From Denver, C. T.

Large deposits of peat have been discovered in the region of the most valuable gold and silver mines in Colorado, at an altitude of 10,000 feet above tide level.

It is well known, however, that extensive beds of coal have also been discovered in the same region, so extensive, and of so good quality, as to give promise of an unlimited supply; and there is, therefore, less probability of the appreciation of the peat than there would otherwise have been in this region; though, until the discovery of coal, it appeared to some to be the material for fuel, on which was to turn the profit or loss of working the mines of this region.

From Woburn, Mass.

I have used about 35 tons of your Lexington peat, under my boiler. It makes steam very quickly, and I think will come into more general use. My fire-box is fitted for coal and a strong draft, but I find that the peat requires only a light draft.

From Rome, N. Y.

We have some 300 acres of peat within the limits of this

city, and it is pronounced to be a superior article for fuel. I have no doubt every pound, properly prepared, could find ready market at the iron works here, or on the N. Y. Central Railroad, and I have been waiting the perfection of the proper machinery to go into the manufacture of it.

From Lexington, Mass.

The following statement is signed by upwards of sixty of the citizens of Lexington and vicinity, who have used the fuel produced at our works, in that town, some of them having had it constantly for the past four or five years.

"The undersigned, having used for domestic purposes peat fuel manufactured at East Lexington, Mass., recommends to the public its use, for the following reasons, viz.: it ignites freely, gives an intense heat, is free from any unpleasant odor, is easily controlled, can be increased or diminished at pleasure without being entirely extinguished, is cheaper than wood, more economical for the most part of the year than coal, and for kindling coal is superior to wood or charcoal. It will burn in an open grate, or any kind of stove, range, or furnace. It requires scarcely any draft, and leaves about five per cent. of ashes."

From Postville, Allamakee Co., Iowa.

I have been engaged for seveal years in working up the geology of the West, and for the last year in Northern Iowa. Have more calls for the examination of peat marshes than I can well attend to.

Some have used the crude peat with great satisfaction, but what is needed is good cheap machinery for *condensing* it.

If the farmers of Northern Iowa with whom I am acquainted, who have inexhaustible supplies of this valuable fuel, only had some cheap machinery with which to manufacture, they would increase their wealth a hundred fold.

We have no coal in Northern Iowa. The R. R. Co., have paid for wood in this town alone, during the past winter, over $20,000, and at this rate, with the very limited supply

of wood to be obtained, we shall soon be *compelled* to look for fuel in our rich peat beds.

I know of scores, perhaps hundreds of farmers, who could make more by manufacturing and selling peat than they do from their farms.

The people need information in regard to this great subject. I have given a good deal of attention to it, and am preparing to lecture upon it.

Substance of an Official Report.

A commission specially appointed to examine and report upon the matter of fuel for the Grand Trunk Railroad, after thorough examination and repeated tests on a large scale, made report in detail, which was published in the Montreal papers; the result of which was, that a ton of peat fuel did fourteen per cent. more service than a cord of best maple wood.

For the peat, they paid (in gold) $3 per ton; for the wood, $5 per cord. Showing a difference *in favor of peat* of fourteen per cent. in *service* done, and ninety per cent in *cost.*

From Lexington, Mass.

For the last two years I have been familiar with the use of peat fuel, manufactured in this town.

It kindles readily, burns with a free flame, and gives an even and pleasant heat.

For keeping a light fire in a grate or coal stove, for making a quick fire in a cooking apparatus, for securing a comfortable heat in a sick room, or for warming a sleeping room, I know of no fuel more servicable or more easily used.

From Medusa, N. Y.

I want to go to manufacturing fuel as soon as we can make it pay.

We are twenty-one miles west of the Hudson River, and within one mile of a large paper mill, and within three miles of two iron founderies. They use hundreds of tons of coal,

for which they pay five dollars per ton *for hauling it* from Coxsackie, in *addition* to the cost of the coal there. Wood costs five to six dollars per cord.

From Minnesota Lake, Minn.

Many of the settlers here have to haul their wood from fifteen to thirty-five miles, and coal costs $35 to $40 per ton; but we have plenty of good peat, and all that is wanting is to start one machine for the manufacture of it in merchantable form, to make a demand for more. I think you could sell fifty machines on this prairie. We are determined to have peat in general use here without much delay.

From St. Albans, Vt.

The Vermont Central R. R. Co. have experimented with about 100 tons, with very satisfactory results.

One engine with three tons of peat drew eight passenger cars 120 miles, and seven cars 140 miles.

Another engine with three tons of peat drew four cars, first trial, 95 miles; second trip, 120 miles; third trip, 120 miles; fourth trip, 160 miles; fifth trip, 168 miles; sixth trip, 170 miles.

I am satisfied that as soon as they can procure a considerable supply at about the cost of wood, say a ton of peat at about the cost of a cord of wood, they would gladly buy 20,000 tons per year.

When it can be manufactured at a cost not exceeding two dollars per ton, I want to engage in it on a considerable scale.

From Providence, R. I.

N. F. Potter, President of the Narraganset Brick Company, the largest in Rhode Island, states that he has prepared hundreds of tons of this fuel, for several years past, at a cost not exceeding $1.50 per ton, and has used it with great success for various purposes, principally for steam service and for burning brick.

His experience corroborates the statements of multitudes of others, that a ton of peat is fully equal to a cord of wood.

He has burned a great many brick with it, and uses for a kiln just the same number of tons of peat that he has been accustomed to use cords of wood, and with full as satisfactory results. His wood cost $7.00 per cord, his peat cost $1.50 per ton.

His testimony is unqualified, both as regards the cost of manufacture and the value of the fuel.

From Ogdensburg, N. Y.

There are a number of good peat beds near our city, but they have not been worked much as yet.

I got out a few tons last year, and it gave perfect satisfaction as a fuel, but it costs too high without machinery.

Coal costs us $11.00, hard wood $7.50.

From Maukato, Minn.

The Novelty Works at this place have used a little peat in their foundery, and prove it superior to coal for their purposes.

They pay $20 to $25 per ton for coal.

From South Bend, Ind.

We have peat beds here that can never be exhausted. The Catholics of Notre Dame University have been making and using two or three thousand tons of it per year for the last three years. This year they have commenced to make about 5000 tons. They use it for heating their buildings. Part of it is cut out with a slane, and part is mixed and made by hand somewhat like brick. When first moulded the blocks are $10 \times 5 \times 4$ inches, weighing about seven pounds; but when thoroughly dry they are about $6 \times 3\frac{1}{2}$ and $1\frac{1}{2}$ inches, weighing about $1\frac{3}{4}$lbs., and as hard as coal.

I first made the experiment on ten or fifteen tons, and they have followed it; but this method is too slow and expensive.

The fuel is good and at $5 per ton, which is equal to a cord of wood or three quarters of a ton of coal, is a quarter cheaper than either of the other kinds of fuel.

The people here are waiting for suitable machinery for its manufacture, and when such is found, it will be readily adopted, and gladly too, for something to take the place of present fuel is sadly needed here.

The railroads are prepared to contract for many thousands of tons of it, and if you have a sure success in its manufacture there can be no better place than this to demonstrate the fact.

From Westfield, N. Y.

I feel a deep interest in the subject of cheap fuel, and especially in the adoption of peat to that end. We have large deposits of it here, shown by analysis to be very pure, free from sulphur, and yielding only from three to five per cent. of ash.

The railroads in this section suffer greatly from the use of *sulphurous* bituminous coal, and I have no doubt they would hail with joy the advent of a cheap fuel which would save their fire surfaces from disintegration.

From Elizabethtown, N. J.

There is a great deal of peat in this region, and if it can be produced so as to be of material advantage to the iron manufacturers of Essex County, it may be immensely important. We hope your efforts may be successful.

From Florence, Benton Co., Iowa.

I started, last year, on a small scale, but intend to go in a little stronger this year. I work it in a box with one-horse tread power, right in the bog.

I expect to prepare with one horse, two men and a boy, about three or four tons of dry peat per day. Do not think my way as profitable as yours, but am not able to buy your machinery, and have to be contented with such as I can afford.

The peat dries very hard, and burns with a bright, hot flame.

Wood has been $5 to $7, and getting scarce, and coals from $8.50 to $15. All we need out here is a good machine that does not cost too much.

It is rather hard for farmers to sell wheat for forty-five cents and corn for thirty cents, and haul it ten or fifteen miles to market at that, and then pay $9 and $10 per ton for such poor coal as we have here in Iowa.

From Portland, Me.

We have the most valuable peat bog on the continent, and in my opinion if the kind of fuel it produces was put in the market, it would supersede all the coal and coke now in use for steam engines and smelting purposes. We want machines to manufacture it.

These extracts from letters are but a few out of many of similar character, and are given here simply to show the general tone of *recent* correspondence among practical men in all parts of the country.

FAILURES, DISAPPOINTMENTS, AND LACK OF SUCCESS.

It is probably a fact, that thus far, both in this country and in Europe, more money has been expended in peat than has been realized from it.

But it is doubtless equally true, that the great losses have been made by those who *squandered* their money recklessly, or went into the matter as a *speculation*, rather than by those who have undertaken the manufacture of the fuel as a legitimate business, to be managed prudently and conducted intelligently, as any business must be, and with the proper means and appliances to secure the results desired.

A discriminating view of the matter, in this light, will doubtless solve the question, and indicate the correct answer

to many who have made the inquiry as to why one and another have lost money.

A multitude of cases have come to our knowledge where parties had put their money into some great "peat *company*," expecting to realize, without effort, returns of untold amount, but knowing really little or nothing of the material from which their gains were to come, giving the business little or no personal attention, and intrusting the management of it to others who knew as little as they, and, in reality, (tenderly be it spoken!) cared less, except to line their own pockets from the sale of "shares," as speedily as possible, and then "step out" before the bubble should burst. *

Reliable information concerniug the manufacture of this fuel is available, and can now be obtained as easily as upon any other subject, and with the proper means and appliances, which are easily procured, and the same ordinary, prudent, and intelligent management which any other business demands, this surely invites attention, and gives unquestionable promise of reward, far in excess of most kinds of manufacturing.

In numerous cases allusion is made to efforts which have been made in one way and another to manufacture the material, oftentimes by methods entirely impracticable, and in many cases quite ridiculous, as a moment's consideration would seem to have shown any reasonable being; while others, in almost equal number, after having produced a fair article (considering that it was, perhaps, their first attempt), instead of making use of it, or testing it, in such simple manner as reason would dictate to a sober-minded person who should give a single thought as to the character and properties of the material, have gone to work in some equally ridiculous manner to "test" it, and have either smothered their fire by putting on an excessive quantity of the fuel (for

* In a letter received since the above was written, allusion is made to one of these cases, in the following significant words: "The matter was placed in the hands of *incompetent persons*, and the result was that peat got *sadly demoralized*."

it should be burned in small quantities), or have allowed so strong a draught (it should be burned under light draught,) as to create the "hottest kind of a fire," and to consume it with unnecessary haste, giving occasion, in either case, to pronounce it impracticable to use the fuel to advantage.

And just there, in many cases, the whole matter has been dropped; and this too, not unfrequently in localities where coal and wood are high, and peat *might* be had, in good shape, at one quarter the price paid for other fuels, if but a trifle more of reason and perseverance were brought to bear in the case.

A WORD OF CAUTION AND ENCOURAGEMENT.

Pioneers in the peat business in any section of the country, though they may reasonably expect to share, to some extent, the difficulties of inaugurating a new enterprise, will, with ordinary good management, prudence, and perseverance, be pretty sure to hold the field, and realize large and legitimate reward.

Most of the new enterprises of the age, especially in mining operations, are understood to demand for their development and success, very large preliminary outlays of money.

Not so with peat: the outlay required is small, while the returns are quick, large, and sure; for "everybody" is a ready customer for *good* "cheap fuel," and such *peat* has been abundantly proved to be.

COUNT THE COST AND THE GAIN.

Unlike an oil well or a gold mine, peat is on the surface of the earth, where it can be seen and examined, the quality tested, and the quantity fairly calculated. The expense of excavating and manufacturing can be readily and accurately ascertained, and the net profits on the sales of fuel can be fairly estimated; in fact, the business of manufacturing peat fuel can be entered into as prudently and understandingly,

and on as fair an estimate of expenditure and return, as any other.

IMPORTANCE OF THE PEAT FUEL ENTERPRISE.

The following from the *New York Tribune* is to the point: —

"The results of numerous experiments, both practical and scientific, have already proved that American peat, however rudely prepared, will answer all the requirements of a perfect fuel, more economical than wood or coal.

"When solidified, it is equal in value to any other fuel for almost any purpose.

"Its composition is closely allied to wood and coal, containing carbon, hydrogen, oxygen, and nitrogen, with less waste in burning than the best of coal.

"The political power of any country depends upon the development of home manufactures. These, as well as the comfort, health, and high civilization of the people, depend upon an abundant supply of cheap, good fuel, widely diffused over the face of the country.

"Since we have destroyed our forests, no other source of supply fills the measure of this requisite so completely as *peat;* and its abundance in this country, where steam is the great motive power, not only for manufacturing, but locomotion, is destined to be the great source of comfort and wealth.

"Everything, therefore, which tends to increase the knowledge of the existence and use of peat, as well as the treatment for improving its quality and heat-producing efficiency, should be ranked as great national blessings.

"The purposes to which peat fuel can be applied are as wide as those of wood or coal. For domestic purposes it is superior to either, except that the peat requires replenishing oftener than a coal fire, and less so than that of wood. It burns in open grates like cannel coal. Its great advantage as a locomotive fuel is, that it burns with great freedom, gives *intense* heat, and throws off no cinders.

"Valuable as this fuel is, and situated as it is at our doors, we believe it can be excavated, dried, and made ready for use with less labor and capital than coal can be mined in Pennsylvania; and peat deposits are so diversified, that the cost of transporting the fuel to the place of consumption would be no more than the cost of transporting wood.

"Another of the great benefits which we anticipate from the use of peat is the saving from further destruction of the timbered land of all the older States, as well as the prairie regions of the West.

"The truly philanthropic minds of the present generation should be at once awakened to the introduction of peat fuel, as likely to produce one of the greatest blessings they could bestow upon the poor.

"The subject is even worthy the attention of every legislature, to encourage the development of peat, its manufacture and use, as one of the best methods of preserving the timbered lands, which add so much to the beauty, health, and wealth of any country, where duly proportioned with the lands under tillage."

COMPARATIVE VALUE OF PEAT FUEL.

Our own experience during a series of years, and the concurrent testimony of intelligent parties, who have used it in various ways, and under a great variety of circumstances, warrant the following general statement, to wit:

As to value for use, in comparison with other fuels, a ton of it, of ordinary quality, is fully equal to a cord of the best oak or maple wood, sawed, split, and ready for use, or about three quarters the value of coal, and for some purposes fully equal to coal.

ECONOMY OF PEAT.

Peat is used in three conditions.

First. In its natural state, as taken from the bed and dried in the open air, more or less pure; some almost free

from undecomposed matter; some containing roots and fibres of plants.

Second. Manufactured and condensed, so that it has almost the density of coal.

Third. Condensed and *carbonized*, or converted into charcoal.

In all of these conditions it is an excellent fuel.

It is not our purpose to speak of it in its native state, although in this state it possesses heating power exceeding that of wood, and little less than that of coal. But when properly manufactured and *condensed*, it is much more durable, and its heating powers and general value for fuel purposes are largely increased.

When *charred* it equals coal, and is more valuable than wood charcoal.

It never clinkers; does not, like coke and coal, attack the linings of furnaces, or destroy the bars of grates, or the surfaces of boilers; and in the treatment of iron ores, in blast furnaces, it gives to cast and wrought iron, which they produce, a superior quality, which cannot be obtained even with the best wood charcoal.

These facts are repeatedly proved by scientific and practical experiments made by competent parties in France, England, Germany, and America.

PEAT AND COAL. — THE DIFFERENCE.

A good peat will generally be found to leave, after combustion, an amount of ash, equal to from three to eight per cent. of its dry weight, and *no* clinker.

It is generally conceded that anthracite coal, as ordinarily burned, leaves ash and clinker to the extent of full twenty-five per cent. of its original weight.

A gentleman who has made numerous experiments for his own satisfaction, informs us that from one hundred pounds of peat burned, he obtained six pounds of ash, while from one hundred pounds "best anthracite coal," burned in the

same stove, there remained twenty-seven pounds of ash and clinker. He says the peat is far preferable to coal, and makes a better fire.

PEAT FUEL IMPROVES BY AGE.

The quality of peat fuel, like wood, is improved by age; that is, the fuel, although stored very soon after it is manufactured, and considered dry and in excellent condition for use, as it really is, will be found to have improved very much, if properly housed, and allowed to remain and cure for three, six, or even twelve months, — the difference in quality being as readily observed as in wood under the same circumstances.

SPECIFIC GRAVITY AND WEIGHT OF PEAT.

As to the specific gravity of condensed peat, we have often heard it said that "peat is equal to the best hard wood." Now we know that the best and hardest woods will float upon water, while it is a fact that ordinary peats, worked by our machinery, produce a fuel which sinks in water, showing its specific gravity to be greater than the best of woods.

By our process, we are able to produce fuel varying from 65 to 80 pounds per cubic foot, according to the character of the crude material; which is equal to from 4 to 5 tons to the solid cord, or $2\frac{1}{2}$ to $3\frac{1}{2}$ tons in its broken condition, as shovelled up and loaded when dry.

In estimating the weight of dry peat fuel per cubic foot, bushel, or otherwise, it should be understood that the *chinks* in peat and in wood, as commonly heaped or piled, probably amount to not far from 30 per cent. of the measured bulk.

Peat fuel properly manufactured will measure about 35 to 38 bushels to the ton of 2000 pounds.

INTENSITY OF HEAT GENERATED BY PEAT.

It is an acknowledged fact that peat produces *intense* heat,

— a feature of so much importance as to entitle it to prominent mention and careful consideration.

Its virtue in this respect is much increased when properly prepared, solidified, and dried, and it reaches its maximum of heating power when solidified and *charred*, or coked.

Mention has often been made of its peculiar qualities in this respect; and any person who will but once make a fire of it, will find a practical demonstration of it, which can neither be disputed or denied.

The amount of heat produced by fuels in their combustion does not always constitute their relative value. For some purposes, it is apparent that this would be the best criterion; but, as a rule, in metallurgic processes, the *quantity* of heat is of far less importance than the *intensity*, or power to raise substances to the highest temperature; and the fuel which affords the greatest quantity of heat is sometimes incapable of producing the greatest intensity.

The *intense* heat generated by *peat fuel* is a subject of frequent remark, and will eventually be dwelt upon, we think, as a very important consideration in estimating its value.

PEAT FUEL FOR STEAM SERVICE.

It is claimed that for ordinary steam service, peat fuel, when properly condensed, is superior to wood or coal.

It is proved, not by experiments alone, but by constant and long-continued use, in numerous places, and under a great variety of circumstances, to be admirably adapted for steam-engines, marine, stationary, and locomotive.

We have used it ourselves, under a stationary boiler, for four seasons, with the most gratifying results.

It saves half the time of getting up steam, and will raise steam to a higher pressure, and keep it higher, than can be done with coal.

The absence of smoke and clinkers, and the preservation of the grates and fire-boxes from the effects of sulphur, are important additional advantages.

A concern in Boston having occasion for *superheated* steam in large volume, and which they were able to produce to the required extent only by the use of two furnaces and the very best of coal under strong blast, made trial of peat fuel, with the following results, as reported to us by them: —

"The peat fuel proved to be entirely satisfactory. Steam was not only generated, but superheated to the full extent and temperature required; and it was satisfactorily demonstrated that with this fuel the whole service demanded might be had from one furnace instead of two, — an item of no light importance."

The fuel was from our works at Lexington.

In Europe, as is well known, it has been used for many years, and to a great extent, although they are far behind us in the matter of preparing it perfectly for use.

A correspondent, who has recently been through Germany, writes, "Peat is universally used here as fuel on all railroads, and in nearly all manufacturing establishments, and for cooking and warming."

A writer in an English paper says, "The practicability of using peat for the purpose of fuel on board steamers is indubitable. I have employed peat as the only fuel for steam during the last four years, and have found it to answer boilers admirably."

Some of its advantages are plainly discernible, and may, perhaps, be briefly stated, as follows: —

It ignites readily and burns freely, generally with a large volume of flame. Combustion appears to be almost perfect, with a very clear and intense heat, producing no cinders, no sparks, no soot, very little smoke, and no clinker; the consequence of which is, that under a boiler steam is generated very much more quickly than by coal, the flues and tubes of the boiler are free from soot, clean and bright, and therefore in better condition to make the heat available, and the grate bars are not burned out and injured as with coal; while as relates to railway service, on the score of comfort to travellers, it may be said that the annoyance and actual

suffering occasioned by cinders, sparks, and smoke, which, in spite of the numerous devices for consuming them, we are now constantly subjected, are, by the use of this fuel, entirely obviated; and so clearly are these advantages demonstrated, that we are satisfied that wherever this fuel is fairly tried, it cannot fail to meet with increasing favor according to its merits.

PEAT FOR LOCOMOTIVES AND HOW TO USE IT.

As relates to the use of peat for locomotives, which is the hardest service to which it can be put, Mr. Hodges, who has conducted experiments on a very extensive scale on the Grand Trunk Railroad, where this fuel has now been in constant use for four years, has offered some remarks, which correspond so nearly with our own observations, and general statements made to us by others who have investigated the matter, and are, withal, so clearly expressed, that we quote.

"Peat fuel, even with the limited experiments as to the best mode of using it economically, has proved itself equal, if not superior, to any known fuel, and it is no more than reasonable to anticipate greater results when its use becomes general, and furnaces are expressly adapted to its use.

"As locomotives are now constructed for the combustion of wood, coal, or coke, the waste of steam power to create a blast or draught is enormous, it being estimated by competent authority that two fifths of the whole quantity of fuel consumed is expended for that purpose. Now, well-dried peat requires but very little draught through the furnace bars, it being necessary for a perfect combustion of the immense quantity of gas that it gives out to admit air through the furnace door. It is therefore much more than probable that, by altering the blast to meet the limited requirements of peat fuel, at least twenty per cent. additional power will be given to all peat-burning engines, or corresponding decrease in the quantity of fuel used may be effected.

"No sparks issue from the smoke-stack of a locomotive when burning peat fuel, even with the present enormous

blast; and when they are especially adapted for it, fires from sparks will be unknown.

"Peat fuel, containing from twenty-five to thirty-five per cent. of water may be burned in a locomotive with a blast and arrangement of fire-box, precisely the same as for wood, and used in the same way, with this difference only, that with wood, the fire-box is always kept full to the top, while with damp peat, not more than six inches covering of the grate is necessary. In ascending long inclines, or with an overloaded engine, it may be necessary, perhaps, to increase the quantity to nine inches; but under no circumstances has the writer ever seen a twelve-inch covering to the fire-bars requisite.

"When it is considered that in burning a ton of green peat, containing only fifteen per cent. of moisture in excess of ordinary air-dried peat, thirty-three gallons of water have to be dried out of it or evaporated during the combustion, and, in addition, that the weight of solid matter in the ton of fuel is reduced fifteen per cent. by the water it contains, the difference of work performed by dry peat over that of wet is not so great as might be expected. This, however, may be accounted for by the little experience we have hitherto had with the fuel, and also from the fact that locomotives have not been adapted to its use.

"The amount of blast required for green peat is not so great as that required for wood; but it burns well in a furnace arranged for consuming wood.

"For dry peat very little blast is required; and when burning in engines adapted for wood, the fuel has to be applied in such small quantities, that it is scarcely possible to keep the fire-bars covered without raising more steam than is required."

A foreign correspondent writes, "For all the locomotives of the railroads in South Bavaria, peat is the only fuel."

We have seen a statement of a locomotive running upwards of three months, over seventy miles of road, and using *peat*, wherein is shown a saving of more than thirty per cent. by

weight over coal, using coal furnaces and flues, with dampers down and fire doors open all the time.

PEAT IN THE MANUFACTURE OF IRON AND THE WORKING OF METALS.

Although in certain parts of Europe peat fuel has for many years been successfully and extensively used in the smelting, reheating, and working of iron and other metals, it does not seem to be generally understood in this country that it is valuable or even available for these purposes.

But that it is easily available and exceedingly valuable, are facts demonstrated and established beyond dispute.

Properly prepared, peat may be used economically and profitably, and tends to the production of superior qualities of iron and steel.

A few facts and opinions, very briefly stated, are all we propose to give here; while for further information the reader is referred to a lengthy article in the book entitled "FACTS ABOUT PEAT," where the subject is treated of much more thoroughly and in detail.

In our own country peat fuel has not been used for these purposes to any great extent.

Numerous experiments with it have been made, with uniformly satisfactory results; and there are establishments which have used it for months together, in smelting, &c., and would gladly have continued to use it had they been able to procure the necessary supply.

One smelting concern in New York State, who used for several weeks three quarters peat and one quarter charcoal, writes, —

"The results gave the fullest satisfaction, as our heat increased very perceptibly, and the amount of limestone for flux was much lessened in consequence, and we could therefore make the iron much faster, and at a saving of full twenty-five per cent. less cost, than with either charcoal or anthracite; and the quality of the iron is pronounced by the

proprietors of some of the largest founderies in this section, equal if not superior to any that they ever saw; so that I feel myself warranted in saying that good peat, properly prepared, will smelt iron ore equal to any fuel now known."

Another, in the same state, have used it so much, and tested it so thoroughly for smelting purposes, that they are not only ready, but anxious to dispense with charcoal and use peat instead, just so soon as they can be assured of a sufficient and constant supply.

They require about twenty-five tons per day.

Several other furnaces in the same region, we are assured, are ready to do the same thing.

Peat from our own works at Lexington, has been used for melting and refining ordinary pig iron, producing an article of malleable iron which, when cold, could be bent and twisted in all manner of shapes, exhibiting an astonishing degree of toughness and flexibility.

We have seen wrought iron produced from the ore by peat, in Canada, said to be of the very highest quality and equal to the best Swedish iron; have seen it bent when cold, and doubled up without a crack or flaw, the edges remaining smooth and sharp, and are told that no iron manufactured from coal would stand such a test.

Another concern in Canada certify that the strength of peat charcoal iron tested by them in the ordinary manner, is considerably above the average strength of iron of the best brands.

In the Lake Superior iron regions, where wood for charcoal is becoming scarce, and abundance of peat is found, preparations are being made to manufacture and use it for smelting purposes.

Mr. Sanderson, of the well known cutlery establishment at Sheffield, Eng., writes, —

"All iron metallurgists have agreed in one opinion, that if peat, by any means, could be produced of sufficient density to enable it, when charred, to stand the blast necessary

for the production of iron, the iron so produced would be of a very superior quality, and when manufactured into malleable iron, it will be appreciated for cables, boiler-plates, armor-plates, wire, and all other kinds of iron requiring more than ordinary strength."

Another English writer asserts, that "peat-coke is of greater value than the best charcoal, and that *in the manufacture of iron it stands unrivalled as a fuel.*"

Still another writer, of much note, says, —

"In Germany, peat mixed with wood charcoal is very extensively used in the production of iron, the peat as prepared there not being sufficiently solid to do the work alone; but it is found that the greater the proportion of peat that can be used, the better is the quality of the iron produced.

"The gas delivered from the high furnaces where peat is used, has also been satisfactorily employed in the refining of iron and the puddling of steel.

"The value of peat in the production of iron has long been established.

"Iron metallurgists agree that the metal so produced is of very superior quality.

"In every stage of iron manufacture and in welding, peat charcoal is most valuable."

Professor Johnson, of New Haven, in his valuable essay, entitled, "Peat and its Uses," remarks, "Peat is extensively used in puddling furnaces, especially in the so-called gas puddling furnaces in Corinthia, Steyermack, Silesia, Bavaria, Wirkenberg, Sweden, and other parts of Europe.

"In Steyermack it has been thus employed for twenty-five years."

We have seen repeated mention made of its use in Germany for the refining of iron and the puddling of steel. So also in France and Italy peat has been successfully used for similar purposes.

The many practical tests and proofs of the value of peat, for the purposes under consideration, surely cannot, if gen-

erally known, remain long unheeded or unimproved by the enterprising iron manufacturers of our own country.

Almost at the moment of writing the above, we are in receipt of a letter from Portland, Me., from which we make the following extract, which appears especially significant as bearing upon the iron interest, of which we have just been writing: —

"I am interested in a large peat property in the vicinity of this city, and want machinery adapted for its manufacture into fuel.

"Peat fuel has been used here just enough to demonstrate its great value, and now all that is required is to produce it in quantities sufficient to meet a larger demand.

"Several of our largest founderies in this and other states are and have been anxiously waiting the completion of such machinery as will give reasonable assurance of a constant and steady supply equal to the requirements of their business.

"As its good qualities become more generally known the demand for it must inevitably be very large."

PEAT FUEL FOR DOMESTIC PURPOSES.

For a summer fuel, for domestic use, there can be little doubt that peat is to be the favorite.

A ton of it is in bulk about one quarter more than coal, and possesses in this respect a decided advantage for summer service, which will be evident to any one who uses it.

A little fire for a cool morning, or evening, can be started even more easily than with wood, and, with a very small quantity of the fuel, will yield a quick and cheerful heat.

With a few blocks only, the fire necessary for breakfast, dinner, or tea can be started, and in good condition for use, in five minutes, and no more need be burned than is required for the special purpose of the hour; avoiding thereby, not only the absolute waste of a very considerable amount of fuel, which, when coal is used, is necessary to keep up the

fire from one meal to another during the day, but the great discomfort of having any fire in the house during the hot days of summer.

If covered with ashes, it will keep for a long time, and can be rekindled at pleasure.

The additional bulk obtained in a ton of this fuel, and the small quantity which is required to be used for the service mentioned above, render it, aside from all other advantages, an *economical* fuel for domestic use in the summer season.

From our own experience, we are well satisfied that those who use it next summer will find good reason for using it the following winter.

PEAT FUEL FOR COOKING.

For ranges and cooking stoves, the fire boxes should be considerably smaller than for coal, as it requires a much less quantity of peat than of coal to make a good fire, though it must be renewed somewhat oftener.

It is easily kindled with a little paper or a few shavings, burns freely, and gives a quick and intense heat. For baking, boiling, and broiling it is excellent, and for heating irons on ironing day there is no fuel equal to it.

It is cleaner than coal, pleasanter to handle, and easily managed for all purposes of cooking.

PEAT FUEL FOR INVALIDS.

It is an established fact, that for the sick chamber there is no fuel which yields so mild and grateful heat as peat. For consumptives, and persons with delicate lungs, it is especially desirable, as it produces none of the painful effects of wood smoke or coal gas. If burned in a *soapstone stove*, it will afford the maximum of comfort to the most sensitive invalid.

There is a traditional opinion among the Irish people that those who use peat fires are less liable to consumption or

lung difficulties than others, and among the early records of this fuel which have come to our notice, we find in the writings of an Irish doctor, as early as 1685, the following: —

"Turf (peat) charred, I reckon the sweetest and wholesomest fire that can be; fitter for a chamber and for consumptive people than either wood, stone coal, or charcoal."

Within the circle of our own acquaintance are those who have borne repeated testimony, not only to the mild and soothing effects of this fuel, but to the absolute relief afforded, in cases of consumption.

APPLIANCES FOR BURNING PEAT FUEL.

It is a matter of no slight importance to ascertain and introduce the best stoves, furnaces, grates, ranges, &c., for burning peat.

Thus far little has been done in this line, though a few enterprising stove dealers have already turned their attention to it, with good prospect of success; and their advertisements are beginning to announce "*Peat* Stoves," &c.

The appliances required are simple, and there will be little difficulty in producing what is needed, or in altering and adapting, by very simple changes, many of the favorite styles now in use for coal.

It should be borne in mind, however, that it is not in the matter of stoves and appliances for domestic purposes alone that these improvements are called for, but in fire-boxes for locomotives, furnaces under boilers, and wherever fires are to be used in the arts, manufactures, &c.; and it is clearly to be seen that this opens a wide field for experiment and invention among boiler and engine builders.

HOW TO USE PEAT FUEL.

For *steam service*, under stationary boilers, it can be used in most any of the ordinary fire-boxes arranged with grate for burning coal; but the area or fire-surface should be much

reduced, the quantity of fuel (in bulk), in the fire-box, should not be more than half the quantity of coal (in bulk), ordinarily used, though it requires to be renewed somewhat more frequently.

The draft through the grate should be much less than for coal, and the door of the fire-box should in many cases be open a little, in order to admit air on to the fire surface, the amount of gas evolved from the fuel generally being so great as to require a large amount of oxygen to promote or admit of the perfect combustion of it, producing, by this means, an unusual volume of flame, the delight of all engineers.

For *locomotive service*, suggestions have already been given on page 46.

For *foundery purposes*, and the working of metals generally, the ordinary arrangements for burning Cumberland coal are, in the main, applicable to peat.

A little experience, with some attention to the matter of strength of draft and the supply of air, will discover to any one, the simple peculiarities necessary to observe under various circumstances.

For *domestic purposes*, it can be used in furnace, range, open grate, and most of the ordinary kinds of stoves in use, either for heating or cooking.

It should generally be burned in smaller quantities and with less draft than coal, but renewed somewhat more frequently.

For *furnaces*, the remarks before made in regard to its use under stationary boilers, are generally applicable.

For *ranges* and *open fires*, the grates should be of less capacity than those generally used, and the draft should be lighter than for coal.

For most *stoves*, arranged with a grate of any kind, on which to place the fuel, it may be used much like coal, observing the same directions repeated above in regard to quantity, draft, &c.

For *burning bricks*, the common style of arches may be

used, but a grating of some kind should be inserted a few inches from the bottom, in order to allow free circulation under the fire, and to permit the ashes to fall through.

Lime is burned in any ordinary kiln, the layers of fuel and stone being alternated.

USE PEAT UNDERSTANDINGLY.

It is an acknowledged fact that very few people have a correct idea of the *economical* use of fuel of any kind.

Everybody is supposed to know how to burn wood, but very few burn it economically, or even prudently. The waste is immense.

So, also, of coal. It was a long time after hard coal was introduced, before the community became even tolerably familiar with its use; but at the present time it is otherwise. With plenty of kindling wood, an abundant supply of coal, a clear grate, and a strong draft, a good fire is started and kept up, "regardless of expense;" but for a moderate fire on a mild day, or for light service, few are skilful enough to kindle or maintain it.

Such being the case in regard to wood and coal, is it reasonable to expect that any one, at the present time, is *thoroughly* posted as to the *best* and most economical methods of using peat?

Our own experience has taught us, and the universal testimony of those who use it is to the same effect, that, as a general thing, peat fuel should be burned in smaller area and bulk than coal, but renewed in small quantities, and under very much less draft.

The quantity of kindling-wood required is very small. The heat is clear and intense.

It ignites quickly, burns freely, and gives an intense heat, almost from the moment it is kindled. It is therefore reasonable to suppose that it should be managed somewhat differently from coal or wood.

It will be of little use for any one to anticipate fair or satis-

factory results as to the value of peat for fuel, if burned in the large fire-boxes now generally in use for coal and wood.

It should be burned in smaller area, with less draft, and renewed somewhat more frequently. We know of trials which have failed to give satisfatory results, from no other cause than lack of attention to these simple but important instructions.

The fire-box under a steam boiler, where peat is used as fuel, should be much smaller than is ordinarily required for coal, and the quantity of fuel on the grates should be less in bulk than of coal.

We have been running, for four seasons, a tubular boiler, of fourteen horse capacity, the fire-box under which was originally 32×42 inches, with grate bars $\frac{3}{4}$ of an inch apart, and 18 inches below the boiler, fitted for coal. We have burned nothing but peat, and, finding that the heat generated was far in excess of what was required, have gradually reduced the area of the grates by laying fire-brick at the sides and end, until now it is only 16×36 inches — *less than half the original area.*

The fire is never more than six inches deep on the grates, the heat is ample, and the quantity of gas generated produces an amount of flame which fills the entire space under the boiler, showing that, if a larger quantity of fuel was used, it would probably generate an amount of gas in excess of what could be consumed under the boiler, and must therefore be wasted. It is burned with very light draft, and gives a quick and intense heat. The grate bars at the end of the fourth year are entirely uninjured, and as good as new.

The same general principles apply to locomotive service. The fire-box should be smaller, and the exhaust considerably less powerful.

It should be borne in mind that peats differ in quality and characteristics, and, consequently, in their heating properties and value, full as much as wood and coal in all their varieties; and that the results obtained from peat fuel, as from any other, will, in all cases, depend very much upon the manner in which it is burned.

We are told that a certain service is obtained from a boiler with one cord of wood, or one ton of coal; but, unless we know whether the wood be pine or hickory, or the coal Pictou or Lehigh, we have no certain data from which to make accurate or even approximate calculations — so, also of peat; it is necessary to know something of its characteristics in each case reported, in order to form a correct estimate of its relative value for the service done. The terms by which to designate these characteristics and qualities, so as to be generally understood and adopted, have yet to be determined upon; but the necessities of the case will doubtless bring them out in good time.

That peat is a *good* fuel, is universally conceded, which is much more than was even admitted for coal, when that was first introduced. The important questions now are as to the arrangement of furnaces, grates, drafts, &c., and the manner of using the fuel to the best advantage, — in other words, "the people" have to learn *how to use it*, but the task is an easy one.

Its real *value* can be ascertained only by using it properly. It can be wasted or burned to disadvantage as easily as coal, but it can be used economically, managed and burned to good advantage *much more easily* than coal.

GAS FROM PEAT.

Gas of an excellent quality, for illuminating purposes, and in large quantities, can be produced from some kinds of peat; and in the ordinary progress of events, it is undoubtedly destined to be extensively used for this purpose, and that at no distant day.

This opinion is freely expressed by those who have given most attention to the subject, and the reasons stated are, the quality and quantity of the gas produced, and the low cost of the material, when compared with the coals at present most in use.

Numerous reports have been published from time to time, but a single statement will suffice to illustrate here.

A gas company, who have recently had a quantity of peat from our works at Lexington, used it with the same amount of cannel coal, i. e., half coal and half peat, and the certificate of their chemist shows a product of illuminating gas of 12 candles power, of 14,376 cubic feet to the ton.

The quantity of illuminating gas ordinarily obtained from the coal mostly used for that purpose in this country, is understood to be from 4000 to 5000 cubic feet, and rarely exceeds 7000 to 8000 cubic feet per ton.

For making and refining iron, the gas produced from peat has been extensively used in France, Germany, and Sweden.

In many places it is used for both these purposes, and its consumption is steadily increasing.

It is distinctly claimed for the Siemens Regenerative Gas Furnace, that it is especially adapted for the successful and economical treatment of metals and glass by the use of *peat fuel*, — a statement of no light importance, in view of the fact that this furnace is now adopted and successfully operated, and its superior merits acknowledged by the most important of the iron, steel, and glass manufactories, in both Europe and America.

See "Facts about Peat" for detailed [illegible]ents on the subject of *gas*.

PEAT FOR GUNPOWDER.

During the last two years we have furnished considerable quantities of peat fuel, to be used in the composition of gunpowder; are shipping the present week a lot of 300 hundred barrels to one concern, and have orders on hand, to be filled during the season, amounting to full 200 tons more, — all for the same purpose.

This is sufficient to indicate that the day of *experiments* in the matter is past, and that the demand for the material is for actual use.

WHAT IS THE MARKET FOR PEAT FUEL?

In all manufacturing or producing business, the question of *demand* is full as important as the matter of *supply*, and among those to whom the subject of *cheap fuel* comes for the first time, as a matter to be considered, the inquiry is not unfrequently made, "Can it be sold?" A moment's reflection, in most cases, brings about as prompt a reply as the Irishman's question, "Would a duck swim?"

Now every family, every place of business, — be it office, store, or workshop, — every manufacturing establishment, and every railroad in the land, are consumers of fuel; in fact, every man we meet is a purchaser of fuel in some shape; some on a small scale, but very many on not only a large scale, but in quantities that are simply immense. Moreover, in some of our heaviest establishments it is the prime article of necessity, the mainstay of the business, the basis of power; without it manufacturing enterprise would be impotent of action, and transportation, another great necessity of all mercantile and commercial transactions, would fail, both by sea and by land.

It is a fact, too, that in no one article of common necessity, not even the bread we eat, is the quality and price so closely scrutinized and carefully considered by every purchaser, large and small, as in the article of fuel.

Without attempting to discuss the matter here, it is sufficient to say, that the brief statements given in these pages, from reliable authorities, show that *peat fuel*, properly prepared, is a *good fuel*, superior even, in many respects, for many purposes, to either wood or coal.

It is also shown, with equal clearness, that it exists in immense quantities, and can be manufactured and produced at very small cost, as compared with either wood or coal.

In other words, it is a *good*, *cheap fuel*. This being the case, the natural result hardly need be stated, for a *good* article, of common necessity, when offered *low*, *commands* a

sale. *The people*, when once made aware of these facts, *will buy it.*

And it is not too much to say, that in any place where it is produced, the *demand* will, for many years, be likely to *exceed* the supply; which will certainly be considered a healthy condition of things for producers of the fuel.

Among extracts from correspondence, on previous pages, will be observed quite a number of instances where the demand for this fuel, in large quantities, is distinctly stated, the fact of its value for the purposes required being now past question.

They are given here only as illustrating a very large number of cases of similar character, which are constantly coming to our notice by direct correspondence; while within the circle of our own personal acquaintance the cases are numerous of heavy concerns, who would be purchasers of hundreds and thousands of tons of peat fuel, at handsomely paying rates (and still consider it *cheap*) the moment they could be assured of a steady and constant supply.

The demand for this fuel for domestic purposes, on similar grounds, is equally apparent.

EXTENT OF PEAT DEPOSITS IN AMERICA.

The peat deposits all through the Northern and Western States and in Canada are immense.

The beds or bogs of peat are so freely distributed that it would probably average as near a market or place of consumption as does the ordinary present supply of wood and coal; while in some regions, especially at the West, where neither wood nor coal are found, the supply of peat is shown to be abundant and of especial importance.

In illustration of this latter remark, we quote from Prof. C. A. White, State geologist of Iowa, who writes, —

"*It supplies a want which would otherwise prevent the full settlement of large districts of our State for a generation to come.*"

The extent, depth, and quality of the deposits vary considerably, and seem to depend upon circumstances quite distinct from each other.

Some cover only a few acres, while others are many miles in extent.

Their depth varies full as much, say from one to twenty feet, though many are reported to be thirty, fifty, and even eighty feet deep; but an average of the depth of what may be considered our peat regions would probably be somewhere from six to twelve feet.

Extended reports in regard to the localities in which it is found in the several States, are given in the book entitled "FACTS ABOUT PEAT."

COAL DUST AND PEAT.

By a modification of our machinery for manufacturing peat, we are also enabled to accomplish most perfectly the utilization of coal-dust; an article which, it is well known, accumulates in very large quantities at the mines, in coal-yards, and elsewhere, and is generally considered of little or no value.

The coal-dust is mingled and manufactured with peat, in such proportions, and in such manner, as to produce *a compound of great strength and solidity*, which *burns more freely than coal*, *yields an intense heat*, *cokes perfectly*, and is *peculiarly well adapted for severe steam service;* also for the *smelting of ores* and the manufacture of *gas for illuminating purposes.*

Repeated experiments demonstrate these facts fully. The fuel is manufactured at a cost, for labor, of *less than one dollar per ton*, after the materials are at the works.

It is an ascertained fact, of no little importance, that *salt water or marine peats* are of value fully equal, and in some respects superior, to inland peats, for this purpose.

There are in the immediate vicinity of New York city extensive deposits of marine peat, of the value of which,

when mixed with coal-dust, of which there are large quantities near at hand, few, probably, have any adequate idea. It would require but short time and moderate expense to develop them.

The men who were ready and eager to *sink* large sums in oil wells, at a distance, are slow to observe the wealth that lies plainly before them nearer home, in the mines which multitudes pass over every day.

The next generation will wonder that this generation of enterprising men is so blind.

The poorer qualities of bituminous coals which prevail in the West, and yield, when burning, so much smoke and soot, if compounded with peat in the manner described, will make a clean fuel, which will burn with great freedom, and yield but a trifling amount of smoke; a fact which it will be admitted is worthy of consideration.

PEAT AS A FERTILIZER.

"Peat is highly concentrated vegetable food," and possesses a value to the farming and agricultural interests of the country *far beyond* what is generally accorded to it.

We have prepared it in the form of a poudret (compounded with ammonial matter) during two seasons, and the united testimony of those who have used it is, that it is a *superior* fertilizer. We have given it the name of the *Bay State Fertilizer*.

It is our purpose here only to allude to the subject. It is treated of at length in *Dana's* "*Muck Manual*," "*Johnson's Essays on Peat, Muck, and Commercial Manures*," and in "*Facts about Peat*."

THE various matters which have been briefly alluded to in the foregoing pages, and many others relating to the subject of peat, are all treated of much more fully and in detail in the work entitled

"FACTS ABOUT PEAT:"

A volume originally issued in pamphlet form, but now revised and enlarged to upwards of 300 pages. Price, $1.75.

It is published by LEE & SHEPARD, 149 Washington Street, Boston; and is also for sale by ORANGE JUDD & Co., No. 245 Broadway, New York, — either of whom will forward it to any address, on receipt of the price.

☞ The table of "Contents" of the above work is given on the following pages, together with "Opinions of the Press," and a portion of the "Appendix," in order that parties desiring information may form some opinion of the elaborate manner in which the subject is there treated.

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APPENDIX OF THE WORK

ENTITLED

FACTS ABOUT PEAT.

We have felt a degree of pride at the exceedingly favorable mention which has been made of the former editions of this work by the press, in all directions, but we have experienced a much greater degree of satisfaction in observing the remarks, oftentimes at considerable length, which have been added, upon the subject-matter of which it treats, showing a quick appreciation of its importance, and a readiness, voluntarily, to aid in disseminating information concerning it, which is rarely accorded to any new enterprise.

Some of the following extracts are of general, others of local, interest; but all are worthy of careful perusal: certain it is, that all, with one accord, bear earnest testimony to the value of "peat as an article of fuel."

From "The New York Independent."

THE ECONOMICAL VALUE OF PEAT.—The great desideratum as to the use of peat has been to devise a method of consolidating it into a manageable and merchantable form at a moderate expense. The practicability of condensing it so as to produce an article of fuel of great value has been abundantly proved by numerous successful experiments. And it has also been shown by experiment that this fuel, when well prepared, has qualities which make it equal to any other, and, for some uses, superior to any.

To burn in an open grate, in a sitting-room, it is both economical and agreeable; and for an open fire in a sick-chamber (where none but an open fire ought ever to be allowed), it is invaluable as a purifier of the air, without the production of any sulphurous or other injurious gas. For steam purposes, it is quicker and more effective than any thing else, and would be of great use in driving our steam fire-engines. In making and refining iron, it is at least equal to charcoal; and, in the finer grades of iron-work, it is invaluable. It furnishes an illuminating gas, having, at least, double the power of coal gas; and many experiments place its comparative value much higher, while a great saving is effected in the manufacture by the entire absence of sulphur.

The one essential problem has been to invent an economical method by which its natural porousness could be overcome so as to solidify it in more convenient

blocks, that can be handled and transported, and that will burn without crumbling to pieces in the fire. The Boston Peat Company, No. 49 Congress Street, Boston, have perfected a process which appears to be completely successful, and at such a moderate expense as to admit of general application wherever there are peat-bogs of the extent of even an acre or more.

By a machine of simple construction, but on a novel principle, the crude peat, wet as it comes from the ground, is dumped into a hopper, completely pulverized, so as to destroy the porousness, which no pressure can wholly overcome, and delivered in moulds, like bricks, which are dried in the open air for two or three weeks, and are then ready for delivery as good solid fuel, nearly as heavy as Liverpool coal. The machine costs fifteen hundred dollars, requires ten-horse power, and will work one hundred tons of crude peat in a day, making twenty-five tons or more of condensed fuel per day to each machine. The ordinary calculation in the city for that amount of steam-power is about twenty-five dollars a week; but as this machine would produce its own fuel, and may even be run with the refuse and unmerchantable stuff, the cost is much reduced. A further reduction would take place where several machines are run by one engine. The cost of ground for drying, and sheds for storage, may be less or more at pleasure. As neither the peat, nor the land it occupies, possesses any value in its natural state, all that is charged for royalty is simply so much wealth created by this great discovery.

There is no lack of peat in this country to supply abundance of fuel for centuries. It is found in all parts of the Northern States, and as far south as Virginia, in vast quantities. The Geological Report of the State of New York describes and locates more than ten thousand acres in the river counties alone. In the central and western sections, the quantities are almost illimitable. In Massachusetts, the Geological Report names nearly one hundred towns which have supplies of peat. Is is so in New Jersey, in Connecticut, on Long Island, and elsewhere.

In sections where other fuel is difficult to be obtained, and very costly, they may have by this process an abundance of the best and most pleasant kind of fuel, both for domestic uses and for manufactures.

When we consider that every acre of peat is calculated to be good for a thousand tons of condensed fuel, worth now eight or ten dollars a ton, at a cost of less than three dollars a ton for preparation, the amount of solid wealth which this invention will add to the country quite leaves petroleum in the background.

From "The Boston Journal."

The high price of coal, and the rapid destruction of our forests, ought to stimulate the people of New England, and indeed of the whole North, to an investigation of the feasibility of bringing *peat* into general use as an article of fuel. Wood is every year growing scarcer in New England, and the use of coal is fast spreading among country towns, where, a few years ago, the article was never seen. Our people have been prodigally wasteful of their wood-lots; and we are fast becoming dependent upon Pennsylvania and the British Provinces for all our fuel. As a consequence, we have been compelled to pay seventeen dollars per ton for coal in this city the past winter; and inland towns have paid eighteen or twenty dollars, while wood was sixteen dollars per cord. All the great cities on the Atlantic coast have been entirely at the mercy of coal operators and speculators, and most exorbitant prices have been asked.

Were wood and coal the only articles that can be used for cooking and heating purposes, we might be reconciled to this state of things. But there is in New England, and indeed throughout the North, a great abundance of peat.

One obstacle to the use of peat has been the difficulty of compressing it so as

to render it less bulky, owing to its fibrous nature, which stoutly resists condensation. This difficulty has been overcome by machinery.

Experiments have recently been made, under the auspices of some enterprising merchants of Boston, for utilizing peat as a fuel. The experiments made here have been completely successful; and, if the sanguine expectations of those who have been engaged in this are realized, New England will, at no distant period, supply her own fuel.

It is well known that peat has been used for fuel, to some extent, in Eastern Massachusetts for several years. There is an abundance of it — thousands of millions of cords — scattered all over New England; and it is time, as we remarked at the outset, that our people were stirring themselves to see if it may not be brought into general use in order to stop the waste of our forests, now growing every year more valuable for timber, cheapen the cost of fuel, and render us less dependent upon coal monopolists and speculators for this indispensable article. It lies at our very doors, and there is no reason why its value should not be developed.

From "The Portland (Me.) Transcript."

Any thing that will give the people relief from the present high prices of coal, and tend to break up the monopoly of the coal-mining interest, while, at the same time, it saves our forests from further destruction, is worthy of a hearty patronage and encouragement; and we hope to see the attention of capitalists turned to the manufacture of peat. The people of Maine, so far removed from the coal-region, and paying so much for its transportation, should no longer neglect the rich deposits of fuel in the peat-beds scattered throughout the State. Dr. Jackson, in his Geological Survey of Maine, long since directed attention to the numerous valuable accumulations of this fossil fuel. He says, —

"The time may arrive when, even in Maine, wood becoming scarce, her neglected peat-bogs will be resorted to for fuel; though here, as in many other sections, were the *superiority* of the article over even wood or coal known and appreciated, the bogs would be worked now, rather than to await the period at which, for lack of other fuel, their valuable deposits shall be drawn upon."

He also says, that the localities of peat in Maine are so numerous, that it is hardly necessary to describe them, but points out localities in Bangor, Bluehill, Thomaston, Limerick, Waterford, and near Portland.

From "The Berkshire County Eagle."

The subject is one which should receive especial attention in New England, where the resources of fuel are not what they need to be.

Railroad men and manufacturers regard peat as superior to coal for the generation of steam, and the manufacture of iron and steel.

From "The New York Evening Post."

It is one of many unphilosophical things in the social history of our people, that so little progress has been made in the use of *peat*. It would seem as though we had been slow to believe that it was made to be used. As a natural product, under the wise ordering of things by the Creator, it is found in abundance in all parts of the country, as low down as the Dismal Swamp of Virginia, in positions easily accessible, and in forms and qualities suited for every purpose of fuel.

In its crude state, the peats most common are not so agreeable as wood or coal for domestic purposes; but the finer qualities of peat are preferable to

either, and most of the common sorts are capable of being condensed into a perfect and most desirable fuel. Being entirely free from sulphurous and other objectionable ingredients found in coal, it makes a delightful fire in the grate, giving a charm to the parlor, and a delight to the sick-chamber. For raising steam, it is unrivalled by any other substance. One advantage is, that it creates no clinkers, and does not spoil the grate-bars like anthracite. In making the best iron, and in the finer processes of working iron and steel, it stands alongside of wood-charcoal. When charred, it is said to be better for welding purposes than charcoal itself. Many peats are also superior to the best bituminous coals for making gas. It is said that some varieties of peat are better for gunpowder than the charcoal made from dog-wood and alder.

In the preparation of peat for convenient handling and use, a great variety of methods has been tried. The oldest and best peats are so solid and fine, that they dry into a hard substance like cannel coal, without any artificial process except cutting the blocks of proper size out of the bog, and laying them on the ground to dry. But most kinds are too light and porous for convenient use, and burn with much smoke and less heat, unless artificially condensed. The most common method was by pressure; but this is expensive, and not fully effectual.

We have seen specimens of *condensed* peat, prepared by the Boston Peat Company, which appear to come nearer to the ideal fuel than anything else within our knowledge.

A single machine, driven by a six-horse steam power, will work fifty tons of raw peat in a day, which will yield about one fourth to one third of its weight in condensed fuel.

As a peat-swamp is generally unproductive, and therefore useless for agricultural purpose, it follows that the cost of fuel is the expense of manufacture, with the addition of the value which the demand may give to land otherwise worthless. The Boston Peat Company have patented their processes, and sell their machines.

From "The Syracuse Journal."

PEAT AS FUEL. — This article is soon destined to enter into lively competition with anthracite; and the probable effect will be that the "coal monopolists" will be brought to their senses and fair terms at the same time.

The article of peat as fuel was put to a test on the Central Railroad yesterday, and proved highly satisfactory.

There is an extensive bed of peat at Oswego Falls, opposite the village of Fulton, in Oswego County, on land owned by Bradford Kennedy, Esq., hardware merchant, of this city. For the purpose of testing its quality as fuel, a quantity was dried and prepared in the usual way, to be tested on one of the locomotives of the Central Railroad. Half a ton of that article, dried and ready for use, was sent down to this city, and Engine No. 106, a wood-burner, made ready for a short trial trip. Superintendent Lapham, of the Central, and Superintendent Van Vleck, of the Oswego Road, together with a party of other gentlemen, including Messrs. Howe and W. S. Nelson of Fulton, Derastes Kellogg of Skaneateles, Mr. Geddes, Jr., Mr. Southmeade of New York, and others, witnessed the trial. The locomotive was fired up at the Round House in this city, adjacent to the Central machine-shops, and run to Warner's Station and back, a distance of twenty miles, in the space of forty-five minutes. The engine drew but the car containing the excursionists, and was propelled at a moderate speed, without any attempt at "making time;" the object being merely to test the article of fuel. The peat made a beautiful fire, throwing out intense heat, and burned with a steady flame. The steam was kept at an even gauge of from ninety to one hundred pounds during the trial trip, and Superin-

tendents Lapham and Van Vleck were highly pleased with the test of peat as fuel, pronouncing it a success. We understand that the usual amount of fuel consumed by coal-burning engines is a ton to every twenty miles; but, in this instance, only half a ton of peat was used, giving evidence of its value as a substitute for anthracite.

From "The Springfield (Mass.) Republican."

Peat contains the same chemical constituents as coal; indeed it seems to be only an imperfect form of the same material, — young coal, coal in the crude.

In Maine, beds of coal have been found in draining a bog, evidently formed from the wood of a species of fir, the balsam of which had been changed to bitumen, with which the deposit is very highly charged.

Peat has long been used for firing in some locations, especially in Ireland, where it makes a sweet and wholesome fire, safer for delicate lungs than either coal or wood. The heat is less drying, the ashes less troublesome, and the smoke does not irritate the eyes.

In its native beds, peat is heavily charged with water; and the want of a cheap method of drying and condensing it has prevented its being burned to any extent in this country; but modern researches have removed this objection, and means have been found for preparing it as fuel in large quantities, in merchantable shape, at a cost of four or five dollars a ton. The process has been patented; and the company, organized in Boston, has works now in operation in Lexington, Mass. The fuel is claimed to surpass coal for many purposes, especially for generating steam, and for the manufacture of iron and steel.

Peat-charcoal is denser than that from wood; and, as it contains no sulphur, iron made with it is of superior quality, and will not splinter.

Gas from peat has been used for some time in Paris: the hydrogen obtained is very richly carburetted, and is better than that from coal for illuminating purposes.

There are numerous indications that the stores of peat found in almost every township, the accumulations of past ages, will prove a rich inheritance to us and our children.

From "The Hartford Press."

The fuel question is already a serious one in manufacturing New England which requires a greater supply for purposes of warmth, and for its thousands of engines, than almost any other part of the country. Our wood has long been scarce and costly; and we are so far from the great coal-beds as to make that material expensive. Attention has lately been directed to peat as a substitute for wood and coal, and, it is believed, with favorable results. A process has been discovered by which peat can be converted into a dry solid substance, in great quantities, at a moderate cost. The fuel so produced burns readily, gives a mellow but intense heat, is most agreeable for burning in the open grate, and is especially adapted to furnaces for generating steam.

From "The Madison (Wis.) State Journal."

The recent invention of machinery for pressing peat, in connection with the increasing scarcity of fuel in the West, and the exorbitant prices of wood and coal, has attracted attention anew to the extensive peat-beds near this city.

The subject of manufacturing fuel from this material was discussed quite prominently some ten years ago among our citizens; but the comparative cheapness of wood at that time, and the absence of any perfected machinery

for reducing it to proper form, as well as the financial revulsion which shortly followed, led to a postponement of the project.

A further investigation of the qualities of this peat, of the extent of the deposit, and of the practicability of cheaply manufacturing from it an article of fuel equal in heating-power to the best coal, induces the belief that it will speedily become a source of immense profit to the fortunate proprietor, and of great advantage to the city and adjacent country. It will also, when worked into convenient compass for transportation, constitute an important article of export to the neighboring cities with which we have railroad connections.

We recently witnessed some experiments with it, as an article of fuel in a common wood-stove. The peat used was unpressed. The specimens burned with a flame clear and brilliant as seasoned maple or hickory, and produced no unpleasant odor like that of coal. From the trial we saw made of it, we conclude that it will make a most desirable article of fuel; and we trust the day is not distant when it will be made available, and this market supplied with it. If we are not mistaken, Colonel Slaughter, in opening this peat-bed, will, if he does not "strike oil," find a source of wealth not less valuable and remunerative.

From "The Madison (Wis.) Patriot."

We feel an interest, in common with our people, in keeping the subject of Wisconsin peat before the public, that it may so interest the attention of capitalists as to insure its more complete development, which we believe to be all that is necessary to bring it into general use, and prove it a source of very great benefit to our people. The middle, southern, and some of the western counties of our State, are but sparsely timbered; and the very limited quantity of timber is growing less every year, until the scarcity and price of fuel have become a question of serious inquiry with the people.

Peat or coal must be used as a substitute, — the latter we have not, nor can it be had, only at a heavy cost; but *peat* we have in abundance, and within our own limits. To this we must sooner or later resort, and the sooner the better for those who are compelled to pay the present high prices of wood.

The peat-beds near this city will, when developed, furnish an abundance of cheap fuel; and, as it is inexhaustible in quantity, its use will prove a source of wealth, not only to the enterprising proprietors, but to the country.

We have seen the peat tried, and find it an excellent substitute for coal. It has been used in our press-room furnace in driving our engine, and found equal to the best coal. We have therefore no hesitation in bearing witness to the good qualities of the peat, having used it; and unite most cordially in the general wish, that this rich mine of wealth may be speedily developed, and the peat brought within the reach of those who would so readily avail themselves of its use. Our wood lands are principally oak openings, and the wood is rapidly disappearing. The price is now from seven to eight dollars per cord. Dr. Hayes, of Boston, the first analytic chemist in our country, pronounces this peat equal to good oak-wood fuel, and for gas equal to the best cannel coal. Many experiments have been made with it in this neighborhood for fuel by our most judicious men, and their accounts correspond with Dr. Hayes's analysis. It must be of great value to the proprietors, as well as benefit to the country.

From "The Milwaukee Sentinel."

Upon a recent visit to Madison, we were shown by Mr. Hough, County Surveyor, a plat of the peat-bog lying six miles west of that town, and immediate-

ly upon the Madison and Milwaukee Railroad. In company with an intelligent Irishman, who informed us that, in density and endurance it was far superior to the Irish peat (not so inflammable, nor vested with the peculiar odor in burning), we instituted some experiments; in the first place by burning in a blacksmith's forge, where it gave out a steady, brilliant heat, though not as intense as that of bituminous coal, yet heating iron readily. We placed a peck of it with an equal amount of Briar Hill Coal in the open coal grate, and found it not only to outlast the coal, but to give a far preferable fire; quietly, pleasantly, not snappishly inclined, and free from the odious smoke and soot of coal, which will be a great *desideratum* to neat housekeepers.

The owners are making arrangements to work the beds extensively during the next season; and we predict for it a large sale, even within our own city, should its cost be even greater than coal, solely on account of its cleanliness. My credulity was heavily taxed while at Madison, through the stories told of its comparative value with wood in generating steam, at a steam saw-mill in the neighborhood of the beds; but I must confess myself astonished at my own experiments, proving it of far more value than I deemed possible, and worth not less than $1,000,000 to the fortunate owners, should no other extensive beds be discovered to mar its value. Surely such unheard of "diggings" ought to stimulate other explorations.

From "The Lewiston (Me.) Journal."

N. W. Farwell, Esq., has used peat in his house and under the boilers in his bleachery. He began his experiments last year, and, though the peat is not of the best quality, yet it proves to be so valuable that he will out a thousand cords the present season. He regards it quite equal to charcoal. It makes a cheerful fire, and lights a room better than wood: its smoke does not irritate the eyes, nor does it obstruct respiration. It can also be used for many manufacturing purposes.

From "The Brunswick (Me.) Telegraph."

The introduction of peat is no mere fancy, but a subject of grave importance, especially in these times of exorbitant prices for coal, and unreasonable prices for wood. The "Journal" speaks of its making a cheerful fire. True; and one of our most cherished recollections is that of an old farmhouse in Byfield, Essex County, Mass., the residence of a grandfather. The kitchen fireplace was large enough to admit an ox-cart; and in that same fireplace always blazed in winter, a peat-fire, giving both light and heat. Beside it we have sat for hours, watching the roasting of potatoes, cracking of nuts, drinking of cider, and maliciously (little rascal that we were) eying the young rascals who were courting the girls, our respected aunts. Those were glorious times; and we have ever since had a fondness for peat as an article of fuel. The fires of love never burn dimly beside it.

From "The Newport (R. I.) News."

We have received from the publishers "Facts about Peat." The work is deserving of more than passing notice. No subject is of wider interest to the whole family of man than that of fuel; and its high price in this country for some time past, gives the subject a peculiar interest to us in America.

Hitherto the world has been dependent upon wood and the different kinds of mineral coal. It has not been a generally recognized fact that there exists another article, formed of wood-deposits like coal, but of a much more recent formation, and known by the name of *peat*, which is destined to be brought

into an important competition with its two rivals, wood and coal. Many people in our own community, we will venture to say, never saw a specimen of it, and have scarcely heard of it.

Its supply is said to be abundant along the lines of our railroads, and in the vicinity of our machine-shops and founderies in all parts of the country where there is woodland. As the article of fuel is one of great expense in our domestic economy, this subject cannot fail to interest all; and the introduction of a new, cheap, and abundant article of fuel, to be dug out at our own doors, as it were, is an important matter. We commend this work, and the subject upon which it treats, to the attention of all.

From "The Fall River News."

We consider this a valuable work, especially at the present time, when coal is almost beyond the reach of the laboring classes. Hitherto we have been entirely dependent upon wood and coal, while almost every township has peat-beds sufficient to furnish the inhabitants with a fuel, in every respect, when properly prepared, equal, if not superior, to either. We cheerfully commend this book to the attention of all; for the whole community are interested in the subject on which it treats.

From "The Nantucket Inquirer."

The peat-beds on Nantucket and the adjacent islands are estimated at six hundred and fifty acres, from one to fourteen feet in thickness. The rapid destruction of our forests, and the constantly increasing price of wood, have now brought the article of peat to the notice of manufacturers and railroad companies, and will no doubt stimulate some enterprising Yankee to get up a machine that will press the peat dry, as it is taken from the beds, and turn it out in the shape and consistence of bricks. Then will our peat lands prove to be a mine of wealth to the owners.

From "The Biddeford (Me.) Journal."

The subject is beginning to excite considerable attention, not only on account of the fears of a growing scarcity of wood, its high price, and also that of coal, but because it forms one of the products of industry, which, when perfected from its raw state, forms, like mines of iron, lead, copper, and silver, great wealth to a nation.

From "The Brooklyn Union."

PEAT. — A NEW PROCESS. — Through the benignity of the Creator, our country is richly provided with the means of counteracting the strikes of miners, combinations of dealers, and quarrels of corporations, which so often distract the coal market, and make fuel scarce and dear. In all directions there are to be found immense beds of peat, which is an excellent fuel for many purposes, even in its crude state. And we are assured that a very ingenious and simple process has been discovered, by which the chief inconveniences in the use of crude peat are removed, and a substance produced which is in some respects preferable to anthracite.

The process, which is patented, requires about two weeks to make the article fit for use, and then it is in as good shape for handling and tranportation as coke.

In this shape, it is found to be almost pure charcoal, easily lighted, burning with a clear fire, producing very little smoke, and leaving only a small residuum of ashes. The ashes are equal to those of wood for fertilizing purposes. The prepared peat has been used for raising steam, for wire-drawing, for

brass-working, and for cooking and heating rooms; and for all these purposes it has been highly approved by good judges. If we are correctly informed, the company profess to be able to furnish fuel equivalent to a ton of anthracite for five dollars.

The development of such a source of wealth, and of general relief, lying all around in lands that are otherwise utterly valueless, will add at once to the general resources of the country, and to the means of comfort and life of all classes of society. If this new method is what it is represented to be, — of which we have satisfactory evidence, — we earnestly hope it may attract the attention of capitalists and business men without delay.

The high price of coal, the scarcity of wood, and the necessity for an abundant and consequently cheap article for fuel, have turned the attention of several of our own citizens to the peat which is found to a very considerable extent on Long Island. In other parts of the Eastern States, the interest of the people is already thoroughly aroused on the subject; and, if we are correctly informed, a company is established in Boston which is experimenting with peat, and has met with some very favorable results.

There is abundance of peat on Long Island, within reach of this city; and the season is not yet too far advanced for cutting and drying it for use in its natural shape. Perhaps there is now hardly time enough to get up establishments for its improved preparation this season, as some machinery is required to be set up. And yet, we believe, if the matter would be taken hold of *at once*, with a few thousand dollars of capital, and a moderate share of judgment and energy, something valuable might be accomplished even this year, and we should at least be in good readiness for another season.

From the same paper.

MORE ABOUT PEAT. — The use of peat for fuel is but little known in this country; but it has become necessary to resort to it as a substitute for coal, as a remedy against strikes, extortion, and monopoly. If the experiments now in progress to consolidate the crude peat, so as to make it capable of being handled and transported without crumbling, and so that it will burn clear like coal, are successful, it will prove a formidable rival for anthracite itself. It is believed that deposits of peat suitable for fuel are scattered all over the Northern States in such abundance as would supply a very considerable part of the demand for fuel, and at a price much below that of anthracite, because it lies on the surface of the ground, is procured with very little labor, and, being found in almost every neighborhood, would make a great saving in the cost of transportation.

The great desideratum has been to contrive a process by which it can be put in merchantable shape at a cost not inconsistent with its value for fuel. Most of the numerous experiments, both in this country and in Europe, have resulted in nothing, either because they failed to effect the object, or that they were too expensive in working. A large part of the contrivances looked to the application of powerful pressure to solidify the peat into blocks convenient both for handling and for use; but powerful pressure is not only expensive: it does not effect the object. Peat is so porous and elastic, that it will not give up either its moisture or air by pressure.

A company in Boston have proceeded on a different and quite novel principle, and have at length completed the invention of a simple and rational process, by which crude peat, as it is taken from its bed, can be converted into a solid, dry fuel, in good shape, in large quantities, and at a moderate cost. The machinery required is simple, and not too expensive for use, and can be easily set up and run by the side of the peat-bed, wherever a small yard can be levelled for

drying it in the open air. They are now prepared to furnish their machines at reasonable prices, with a guaranty that they will work as represented. The machine receives the crude peat as taken from the bog, and delivers it, in a very few minutes, *condensed*, and formed into blocks of any desired form, ready to be dried in the open air, and with but small cost for manual labor. Its tenacity for water is so far changed, that it dries in a small part of the time required for curing the ordinary peat.

We have seen specimens of the peat condensed by this process, and are acquainted with the principle on which the machine works, and think there is no reason to doubt its efficiency. The personal character of the principal managers is fitted to inspire confidence that they would not come before the public unless they had got a good thing, calculated to be a general benefit. Indeed, their method may fairly claim to be not only the best, but the only one, so far as is known, in this country, that is at once effectual, cheap, and rapid. They are the pioneers of the present movement in favor of the use of peat, having been engaged for several years in their experiments and inquiries. Their actuary, Mr. T. H. Leavitt, has published a pamphlet of a hundred and eighteen pages, containing more information — historical, scientific, and practical — about peat, we venture to say, than any other man in the country is possessed of. And his perseverance is well entitled to the success which seems about to be realized.

Those who wish to become thoroughly informed should procure this pamphlet; and those who would transact business with the company, should address the agents, Leavitt & Hunnewell, 49 Congress Street, Boston.

From "The Lowell Journal."

This is a good-looking pamphlet of a hundred and sixty-eight pages, giving us all the information upon the subject of peat that the most laborious and extensive research can possibly furnish.

The subject of fuel is one in which all of us are directly interested. Wood and coal, their different varieties and properties, are tolerably well understood; but peat, to a considerable extent, among us, is a new article; and even those who have used it in its crude state do not realize the extent to which it might be used, especially for manufacturing purposes, if properly prepared, and placed in the market.

From "The Prairie Farmer," Chicago, Ill.

This subject is attracting much attention at various points, on account of the scarcity and high price of fuel.

From "The Northern Farmer," Fond du Lac, Wis.

We have received from Messrs. Leavitt & Hunnewell, of Boston, Mass., a pamphlet on the preparation and uses of peat. With their improved method of preparing it, it bids fair to become of great value to our State, as we have, no doubt, abundance of it here. It may eventually fill up the greatest deficiency of our State, by furnishing an article equal to coal for fuel and smelting purposes.

From "The Kenosha (Wis.) Telegraph."

A Good Thing. — Madison, in this State, and Chicago, Ill., have been boasting for some time past of having in their immediate vicinity large beds of peat, which are capable of being turned to good account for fuel for domestic purposes, but more especially for mechanical purposes. Well, Kenosha cannot

afford to be behindhand in any of these great natural resources; so she also boasts of her inexhaustible peat-beds.

Our fellow-citizen, Harvey Durkee, informs us that he has, on his farm, about two and a half miles from the city, a deposit of peat, which has been pronounced, by those qualified to judge, to be of the very best quality of that article. Old men who have used peat most of their lives, in Ireland, declare this to be in every respect equal to the best that country produces. This bed is three fourths of a mile in length, twenty rods wide, and ten feet in depth. Mr. Durkee has dried and tried some of this peat, and finds that it burns freely, makes a very hot fire, and leaves no residuum but a small amount of white ashes. He put a hodful of the prepared peat into his coal stove, and it burned as long, and gave out as much heat, as the best quality of hard lump coal. With the proper facilities for cutting and preparing the peat for use, we understand it can be furnished, probably, for $8 per ton; and one ton of the peat will go as far, and make as much heat, as two tons of the best Lehigh coal, for all mechanical purposes.

Now, if anybody or any company wish to start a woollen factory, or a cotton factory even, here is the material for the necessary fuel, so cheap as to throw the advantages of water-power into the shade. Since Mr. Durkee proved the qualities of this peat, we understand he is decidedly in favor of starting both a woollen and cotton factory, confident that no other locality in the State presents so many advantages for such manufactures.

From "The Brunswick (Me.) Telegraph."

Peat was first discovered in this town by Henry Putnam, Esq., about fifty years since, in the swamps east of Stetson Street. Several persons were much excited about it as a valuable discovery; but nobody was disposed to go into a peat speculation. I do not think, in the usual manner of cutting and drying, it can ever become a popular fuel. The difficulty of getting it thoroughly dry, would, in our uncertain climate, be a serious objection; but if it can be cheaply manufactured into neat, compact, solid blocks, I see no reason why it should not compete successfully with coal and wood.

This matter interests every one who has to buy a cord of wood. The article is abundant in this town: I presume all our swamps are underlaid with it. There is a large tract intersected by the McKeen Road, which drains Mere Brook; the Duck Pond Swamp is another large deposit; the Dunning Swamp on Union and Pleasant Streets; another lies east of Federal Street; and another still farther east, extending from near the river, at the place formerly occupied by Mr. Bow, down to Humphrey's Mills; and there are doubtless many other localities in the town. N. S.

From "The Hingham Journal."

The use of peat as fuel is now attracting, generally, the attention of railroad men, manufacturers, and others; and, in this view, the issue of the pamphlet is timely. The treatise is prepared with care, and embodies much useful knowledge.

From "The Vermont Watchman."

Facts about Peat as an Article of Fuel. — A well-timed and well-executed compilation of important facts. We never knew of any use of peat for fuel in Vermont, wood having been, and in some portions of the State still being, very abundant. There are regions in the State, however, where peat will be more economical than wood or coal; and we shall be glad to see it tried. Peat abounds in the State, from mountain tops to valley swamps; and

doubtless in many places it is of sufficient depth and solidity for fuel. This book describes the article, the mode of cutting and curing, and its uses. For many purposes, good peat is at least equal to wood, and for some superior; while its use will drain swamps, and turn them to agricultural account, and prevent that denuding of the hills, of the woods, which is fast robbing us of water springs, and exposing the hills to be washed clean of the most valuable soil, and, in time, to become as ugly and sterile as the hills in the oldest parts of Maryland now are. Of all men, the farmers should turn their attention to peat, for the preservation of their best forests for more valuable uses than fuel.

From "The Pawtucket (R. I.) Gazette."

No doubt can be entertained by those who have even a limited knowledge of peat, that it can be advantageously used for fuel; but it has thus far received but very little attention in this country. Mr. Leavitt's facts and remarks throw a great amount of light upon the subject, and they ought to have a wide circulation. We have an abundance of peat; and the pamphlet before us tells us of its importance as an article of fuel, and how to prepare and use it.

From "The Lowell Citizen."

In late years, peat has come to be extensively used, not only for fuel, but as a source of motive-power, for the manufacture of gas, paper, gunpowder, and even for building and ornamental work. The questions of its supply, preparation, and most economical use, are of high interest; and this pamphlet embodies much needed information, which will aid in their solution.

From "The Essex County Mercury," Salem, Mass.

Peat has long been used to a considerable extent for fuel in different parts of Essex County; and not a few of the elder portion of our readers can well remember when it was much used in Salem. At the present prices of coal and wood, peat is much to be preferred to either of them, for most uses.

From "The Providence Daily Press."

"Facts about Peat" are not only interesting, but of the highest value. The company who have undertaken to develop the value of peat ought to be encouraged by all who have money to invest in new and probably remunerative channels of trade or manufactures. For ourselves we have often wondered how little use was made of peat.

The glowing heat and cheerful light of a peat-fire, are the very ultimata of a social evening; and our recollections of such a fire on the hearth at Johnny Campbell's, at the head of Loch Rannoch, are of the pleasantest character; so pleasant, indeed, that deprived of the sight of the fire, and the smell of the reek, we have even endeavored at times to find an insufficient consolation in the *taste* of the peat-reek in the genuine Glenlivit.

From "The Lawrence Sentinel."

There can be very little doubt of the utility of the great peat deposits in this Commonwealth, to which public attention has but to be rightly directed, to enhance greatly its value; and this work ("Facts about Peat") will be found to possess a permanent value.

From "The Waltham (Mass.) Sentinel."

The peat-bogs about us are represented to contain a large percentage of bituminous matter; and, when the peat is subjected to great pressure, it becomes a species of bituminous coal. Peat is said to be the last stage of vegetable matter before changing to coal.

If the working of the peat-bogs will save our woods, which are being cut down in such haste, and with so little of consideration, then we hope the attention of the people will soon be turned to this matter.

From "The Portland Advertiser."

We do not know how extensively this pamphlet has been circulated; but we are persuaded that its perusal by every consumer in New England would be productive of great good, and excite a new enterprise throughout the New England States.

From "The Middlesex Journal," Lowell, Mass.

Peat, as an article of fuel, has long been known; but it has not been so extensively used as its merits would warrant. The attention of intelligent men in manufacturing and railroad circles has, however, recently been turned to the subject; and we may hope, ere long, that it will take its proper place in the household, the manufactory, and on the railroad.

With coal at $16 and $17 per ton, the public have a deep interest in any thing which promises to render fuel more abundant and cheap.

In many localities in New England, and throughout the country, the earth is well stored with peat, which promises to add much to the wealth of those farms and districts of country where it is found.

From "The Boston Traveller."

FACTS ABOUT PEAT.— It is a thorough production; the author proceeding exhaustively, and arranging his abundant matter in a manner that renders the task of following him easy and profitable. He has mastered his subject, and evidently has neglected nothing that is calculated to illustrate it, and to press useful facts on the mind of the inquirer.

Various, minute, and copious in its facts, and showing how valuable is *peat as an article of fuel*, this work must have a great effect in directing attention to a neglected agent for the production of heat; one which Providence has placed most freely at the command of man, and which ought to be made to enter very largely into human consumption.

Mr. Leavitt is literally correct when he says, that the substance of which he treats so well "is of sufficient importance to command earnest attention, not only from the business man, on the score of its application to domestic purposes, manufactures, and the arts, but from the philanthropist, in view of the relief it may be made to afford as one of the necessaries of life."

It needs only that the value of peat should be understood to bring it into general use, to the great relief of all interests.

From "The Scientific American."

In peat we shall find an economical substitute for coal at its present prices and even at rates much below; for the marketing of the former substance, or preparation of it so as to render it available, must certainly cost far less than coal.

No shafts have to be sunk, no extensive and costly system of engineering

and surveying are needed; and beyond the expense of the machinery for *condensing* it, little seems to be required to utilize the deposit with which Nature has covered large tracts of land in this country.

The testimony of scientific men is freely given as to its value.

From "The Syracuse Journal."

Dr. R—— is making arrangements to prepare his peat for market. Now let us estimate the quantity upon the fifteen acres. Fifteen acres, at an average depth of eight feet, will produce 40,836 cords. Estimating a cord of peat to be worth a cord and a half of hard wood, there will be equal in value to 54,448 cords of hard wood. Estimating wood at six dollars a cord, the total value of this peat-bed, when marketed, will be $326,688. Allowing sixty-six and two thirds per cent. cost for preparing and transporting it to market (which is a large allowance), and there will remain a net profit of $108,896.

Peat emits a considerable flame — about between hard coal and hard wood; it leaves no cinders to sift; it burns equally well in a coal-stove, wood-stove, or fireplace, and makes a very pleasant fire.

From "The New York Evening Post."

The high prices of coal are having an effect which will soon be turned to the advantage of the community. Already they have brought into existence several enterprises, which, in a few months, will produce a large supply of fuel from the *peat* deposits of this country; and it will be likely to come into close competition with the fuel from the coal mines.

The probability of continued high prices, together with the favorable results of recent experiments with *peat*, and new discoveries of it in quantities, have called the attention of many business men to this substance, as a new source of supply.

The burning or heating properties of the best peat are nearly equal to those of anthracite coal.

There are many peat-beds in this State. A trial of it is making at the American Institute Fair against coal, with satisfactory results.

Great interest is felt by many citizens to whose knowledge these facts have come, and they are confident that a material change will eventually take place in regard to the fuel supply of the country. The tendency will be, in any event, to protect the public from speculations and monopolies in coal.

From "The American Artisan."

The very high price which coal has lately reached in this country has led some enterprising capitalists to turn their attention to the subject of obtaining supplies of peat for fuel.

There are in the United States, large quantities of this valuable material. In Western New York and on Long Island there are extensive beds; and there is little doubt that in and near the neighborhoods where it is found it may be made to serve as an economical substitute for coal, even when that is at a much lower price than at present.

From "The Lockport (N. Y.) Daily Union."

The rapid advance in the price of wood and coal within the past few years, and the near approach of the time when wood, on account of its scarcity, shall cease to be generally used as fuel, have led many to investigate the practicability of bringing into use as a substitute, peat, which was known to be in large quantities in various parts of the country. It was found to be impracticable to

be used as fuel in its natural state, on account of the foreign matter, and its unwieldiness and bulk; being thus impossible to make it a mercantile commodity, and difficult and unhandy to use. Many experiments have been tried by which the foreign matter could be separated, and the peat put in some neat and compact form, thus making it easy to handle. More or less success has attended the various attempts; and in some parts of the country it is rapidly being brought into use.

In this country, we have inexhaustible beds of peat; and if this experiment is the success that is hoped, we need no longer tremble as we see our forests rapidly falling away, or sigh when we read of a strike in a coal mine. It is estimated that the cost of manufacturing will be one dollar per ton. All that it will bring over three dollars will go to the manufacturer as a profit and interest on the capital invested in the bed. Prices, however, regulate themselves in accordance with the demand; but it is hardly probable, with all the peat-beds in the country producing fuel, that wood and coal can lord it much longer in their present manner. One ton of this peat is estimated to burn as long as a ton of coal or two cords of wood. The smoke from it is much like that from hickory wood — thin and blue; there appeared to be no unpleasant odor; and the ashes are not troublesome, like coal-ashes. In fact, there appears to be no reason why, if it can be put in merchantable form, that it should not become our staple article of fuel.

The prospect of such a revolution in fuel will undoubtedly interest the community at large.

From "The Springfield (Mass.) Republican."

The high price of coal and wood is very naturally turning the attention of the public to the vast beds of *peat* which exist in various parts of the country, with the hope of finding in them the much-desired cheaper fuel. In old countries, peat has long been used as an article of fuel, especially among the poorer classes, who have, in fact, known nothing else. But in this comparatively new country, where hitherto both wood and coal have been abundant and cheap, our peat-beds have, for the most part, been allowed to lie unmolested, as the product could not be taken out and prepared for market at a cost low enough to make it any object to bring it into competition with other articles of fuel.

But with ingenuity, stimulated by the present high prices, the problem of how to prepare peat for market at a reasonable cost bids fair to be speedily solved, if, indeed, it is not already satisfactorily answered. Of the value of peat, properly prepared, as an article of fuel, there is no question. Besides its worth for domestic purposes, in which the majority of people are most interested, it is unrivalled by any other substance for raising steam, and has lately been tried with marked success in the locomotives of the New York Central Railroad. Being free from sulphur, peat is also well adapted for the reduction of ores; and in making the best iron, and in the finer processes of making iron and steel, it is equal to wood-charcoal; and, when charred, it is pronounced better for welding purposes than charcoal itself; while some kinds of peat are equal to the best bituminous coal for making gas.

At present, the great bulk of peat would make the item of freight a large one if it was transported any great distance. But we do not see why, already, peat cannot be furnished to those who live near the beds, at a cost much less than coal, to which it is said to be equal, ton for ton, for many purposes. Labor and freight are, of course, the principal items in the cost of peat; and, as soon as quick and cheap methods of extraction and condensation are really discovered, there will be a large use of peat, and some of the profits that now go into the pockets of owners of coal mines will be transferred to the proprietors of peat-beds.

It may not be generally known that there are almost inexhaustible peat deposits within a few miles of this city. Mr. Reuben Brooks, of West Springfield, owns a large peat-bog, and there are others in West Springfield and other towns in this vicinity. Mr. Brooks has long used peat in his own family with satisfactory results, burning it in a common coal grate, where it gives forth a blaze like wood, and a heat much softer and pleasanter than that from the common anthracite or even bituminous coals. We have no means of knowing how the price of it delivered would compare with the price of other kinds of fuel; but peat is going to be the fashion before many years, and Springfield is to be congratulated on having a large supply close at hand.

From "The American Railway Times."

STEAM FUEL.—Wherever the main source of artificial motion may lie hidden away, awaiting ultimate development, whether in air, or in water, or in the heat of the earth itself, matters less to the practical man than to the philosopher.

Coal has long been the main source from which that power has been obtained. How much longer it may continue so to be is uncertain, not so much from any immediate probability of failure in the supply, as that, of late, other substances have been utilized which hitherto were comparatively unknown, or considered inapplicable to the purpose of steam generation. It becomes us to consider, not only how to economize that supply, which we can at present call our own, but how to produce a fuel which shall satisfactorily occupy its position as well now as when our coal-fields cease to yield.

The two main sources from which the present generation may expect to derive practical benefit, and to which we may look for aid in the economizing of our coal, are *peat* and *petroleum*.

The deposits of peat in Great Britain and Ireland occupy an area of about six million acres. The thickness of peat varies in different localities, from two to forty or fifty feet. Assuming the average thickness to be only twelve feet, an acre would yield about 3500 tons of dried peat; consequently the aggregate estimated acreage in this country would produce twenty-one thousand million tons of dried peat, equal to the supply of twenty-one million tons per annum for a thousand years. It cannot be supposed that these enormous masses of vegetable matter were created to be either useless or noxious. Nor is it a matter for wonder that attention has often been directed in this country, and in others where similar deposits exist, to the means of utilizing the peat, and reclaiming the land which it covers.

The value of *peat*, when properly dried, is well known and admitted, both for domestic fuel and for generating steam; and charcoal properly made from such peat is, in all respects, equal, if not superior, to wood-charcoal. When dug from the bog, peat generally contains from fifty to seventy-five per cent. of water.

The inference drawn from practical experience is, that, to insure commercial success in utilizing peat, the operation must be inexpensive and expeditious, costly machinery being avoided.

From four to five tons of peat, as taken from the bog, are required to make one ton of dry condensed peat. The cost varies in different localities; but it may be safely assumed that the average cost will not exceed that of coal at the pit's mouth. Peat thus prepared burns very freely, will stand a powerful blast, emits great heat, is smokeless, and produces less ash than the average of coal or coke. It is impervious to water, improves by keeping, and is incapable of self-ignition. From two and a half to three tons of prepared peat will make one ton of excellent charcoal, according to the degree of carbonization required.

The general heating power of the condensed peat has been proved to be very superior to that of coal; and, in fact, this article appears to be well adapted as a fuel for steam-engines, whether marine, stationary, or locomotive. Its use has been found to effect a saving of fifty per cent. in time in generating steam, and it will do double duty as compared with coal. The absence of smoke and clinkers, and the preservation of furnace-bars and boilers from the destructive effects of sulphur from coal, are additional and important advantages.

The locomotive engineers of three railways in Ireland united to carry out a practical trial of the condensed peat on the Belfast and Northern Counties Railway, with the view of testing its qualities as a fuel for locomotives. The trip was made from Carrick Junction to Ballymena, a distance of twenty-seven miles. During the whole of the journey there was an excess of steam, although the fire-door was kept continually open, and the damper down, for the greater portion of the distance. The pressure at starting was a hundred pounds per square inch. The commencement of the journey was up an incline of one in eighty, four miles long, and with double curves; while ascending the incline, the pressure rose to a hundred and ten pounds, and afterwards to a hundred and twenty pounds; and this with the fire-door open. The speed was about forty miles an hour. While on the way, the fuel emitted no smoke, and very little when at stations. The fire-box was examined at Ballymena, and a very small portion of clinker was found. The smoke-box was perfectly free from cinders or dust,—a proof that the fuel had stood the blast exceedingly well; and it is the recorded opinion of the experimenters that the condensed peat was in every respect well adapted as a fuel for locomotive purposes.

In the face of such results as these, bearing the testimony they do to the fitness of properly prepared peat as a steam-fuel, the wonder is that it has not been generally brought into use. One reason why it has not, may lie in the limited quantity manufactured for steam purposes, the greater value of peat lying at present in its conversion into charcoal for smelting, for which purpose it is used in considerable quantities with the best results. Another cause for its non-adoption may be the hesitancy to depart from the old beaten track, which so often stops the way of improvement. The success of the practical trials it has undergone ought to be sufficient to commend its further use. No serious alterations to machinery are involved in its adoption, the only thing necessary being a reduction of space between the fire-bars to insure perfect combustion.

Such a substitute for coal or coke deserves attention. The comparative absence of smoke, and the total absence of all sulphurous vapors, ought to be a sufficient inducement, independently of the economy effected.

The question of the use of peat in locomotives is not a new one. About twenty years since Lord Willoughby d'Fresby had some tried in the Hesperus Locomotive on the Great Western Railway. This engine was of Hawthorn's patent return-tube construction, and required about one third more peat than coke, with equal drafts. Mr. Vignoles has also interested himself in the same direction. Opposite opinions, however, have always existed as to the economical merits of peat; but it may yet prove an efficient substitute for coal in all its varied uses.

From "The Waltham Sentinel."

There is more in *peat* than is dreamed of in most men's philosophy.

FACTS ABOUT PEAT.

OPINIONS OF THE PRESS.

"An elaborate pamphlet, designed to show the economy of peat as a substitute for wood and coal, especially where fuel is required in large quantities. To this end, Mr. Leavitt has prepared an exhaustive statement of the history and properties of peat, the localities of peat-beds, the methods of preparation and manufacture, its applicability to the various arts, as well as to the production of heat, and other incidental matters of practical importance." — *Worcester Spy.*

"It will be found especially interesting to manufacturers and railroad managers." — *Hartford Courant.*

"It is full of information as to the value of peat, and its whereabouts." — *Bridgeport Farmer.*

"Mr. Leavitt shows conclusively, that peat is equally as good as coal, and for many purposes unquestionably superior, especially for generating steam, and for the manufacture of iron, steel, and other metals." — *Cheshire Republican.*

"The treatise is prepared with care, and embodies much useful information. The use of peat is now attracting, generally, the attention of railroad men, manufacturers, and others; and, in this view, the issue of the pamphlet is timely." — *Roxbury Journal.*

"An octavo pamphlet of 120 pages, elegantly printed, compiled by T. H. Leavitt, Esq. It is a thorough production, the author proceeding exhaustively, and arranging his abundant matter in a manner that renders the task of following him easy and profitable. He has mastered his subject, and evidently has neglected nothing that is calculated to illustrate it, and to press useful facts on the mind of the inquirer. Various, minute, and copious in its facts, and showing how valuable is peat as an article of fuel, this work must have a great effect in directing attention to a neglected agent for the production of heat, one which Providence has placed most freely at the command of man, and which ought to be made to enter very largely into human consumption. Mr. Leavitt is literally correct, when he says that the substance of which he treats so well 'is of sufficient importance to command earnest attention, not only from the business man, on the score of its application to domestic purposes, manufactures, and the arts, but from the philanthropist, in view of the relief it may be made to afford as one of the necessaries of life.' Mr. Leavitt's work should be read by all, as it is full of information, and it needs only that the value of peat should be understood, to bring it into general use to the great relief of all interests." — *Boston Traveller.*

"The pamphlet is full of most interesting facts on the subject." — *Hartford Press.*

"Replete with interesting and instructive 'Facts,' demonstrating that abundant sources of supply are to be found in all the New England States, and its economy over wood and coal. We are persuaded its perusal by every consumer in New England would be productive of great good, and excite a new enterprise throughout the New England States." — *Portland Advertiser.*

"We would recommend any one whose pockets are interested to the amount of $25 for fuel, to get the book and read it." — *Brunswick, Me., Telegraph.*

"A well-timed and well-executed compilation of important facts. Of all men, farmers should turn their attention to peat for the preservation of their best forests for more valuable uses than fuel." — *Vermont Watchman.*

"The development of such a source of wealth and of general relief, lying all around, in lands that are otherwise utterly valueless, will add at once to the general resources of the country, and to the means of comfort and life of all classes of society. If this new method is what it is represented to be, of which we have satisfactory evidence, we earnestly hope it may attract the attention of capitalists and business men without delay." — *Brooklyn Union.*

"A very interesting work. The subject is beginning to excite considerable attention, not only on account of the fears of a growing scarcity of wood, its high price, and also that of coal, but because it forms one of the products of industry, which, when perfected from its raw state, forms, like mines of iron, lead, copper, and silver, *great* wealth to a nation." — *Union and Journal, Biddeford, Me.*

"A good-looking pamphlet of 120 pages, giving us all the information upon the subject of peat that the most laborious and extensive research can possibly furnish." — *Lowell Courier.*

"It contains more historical facts on the formation of peat-beds than any thing we have heretofore seen." — *New York Spirit of the Times.*

"A company in Boston have at length completed the invention of a simple and rational process, by which crude peat, as it is taken from its bed, can be converted into a solid, dry fuel, in good shape, in large quantities, and at a moderate cost. The machinery required is simple, and not too expensive for use, and can easily be set up and run by the side of the peat-bed. We have seen specimens of the peat condensed by this process, and are acquainted with the principle on which the machine works, and think there is no reason to doubt its efficiency. The personal character of the principal managers is fitted to inspire confidence that they would not come before the public, unless they had a good thing, calculated to be a general benefit. Indeed, their method may fairly claim to be not only the best, but the only one, so far as is known, in this country, that is at once effectual, cheap, and rapid. They are the pioneers of the present movement in favor of the use of peat, having been engaged for several years in their experiments and inquiries. Their actuary, Mr. T. H. Leavitt, has published a pamphlet of 118 pages, containing more information — historical, scientific, and practical — about peat, we venture to say, than any other man in the country is possessed of; and his perseverance is well entitled to the success which seems about to be realized.

"Those who seek to be thoroughly informed should procure it. And those who would transact business with the company should address the agents, Leavitt & Hunnewell, 49 Congress Street, Boston." — *Brooklyn Union.*

"A very handsomely printed and valuable pamphlet, containing 'Facts' which are not only interesting, but, if borne out by actual experiment, of the

highest value. Turning listlessly to its title-page, we became so much absorbed in its pages, that we read it as closely as an editor ever finds time to read anything; and we came to the conclusion that the company who have undertaken to develop the value of peat ought to be encouraged by all who have money to invest in new, and probably remunerative channels of trade or manufactures. The glowing heat and cheerful light of a peat fire are the very ultimatum of a social evening." — *Providence Daily Press.*

"The work is deserving of more than passing notice. We commend it, and the subject of which it treats, to the attention of all; for no subject is of wider interest than that of fuel." — *Newport Daily News.*

"There is an abundance of it, thousands and millions of cords, scattered all over New England, and indeed throughout the North. It lies at our very doors. It is time that our people were stirring themselves to see if it may not be brought into general use, in order to stop the waste of our forests, now growing every year more valuable for timber, cheapen the cost of fuel, and render us less dependent upon coal monopolists and speculators for this indispensable article. The 'Facts,' compiled by Mr. Leavitt, embrace much interesting and valuable information." — *Boston Journal.*

"A glance over its pages shows that the compiler has labored with care and discrimination in the collection and presentation of his materials. We have a fondness for peat. The fires of love never burn dimly beside it. Its introduction as an article of fuel is no mere fancy, but a subject of grave importance." — *Brunswick Telegraph.*

"A thorough treatise on the qualities and practical uses of peat." — *Old Colony Memorial.*

"We consider it a valuable, timely, and interesting work. The whole community are interested in the subject of which it treats." — *Fall River News.*

"The questions of its supply, preparation, and most economical use, are of high interest; and this pamphlet embodies much needed information, which will aid in their solution. It embraces much curious and instructive matter of practical and scientific interest." — *Lowell Citizen.*

"Mr. Leavitt's facts and remarks throw a great amount of light upon the subject, and they ought to have a wide circulation. We have an abundance of peat; and the pamphlet tells us of its importance as an article of fuel, and how to prepare and use it." — *Pawtucket, R. I., Gazette.*

"A valuable pamphlet, containing 'Facts.'" — *Salem Mercury.*

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